

TM-026

INDY 800

Service Information



KEE GAMES

A SUBSIDIARY OF ATARI

ATARI, INC.
14600 Winchester Blvd.
Los Gatos, CA 95030
Telephone (408) 374-2440
Telex 357-488

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(b) Such products are returned prepaid to Seller's plant; and

(c) Seller's examination of said products discloses to Seller's satisfaction that such alleged defects existed and were not caused by accident, misuse, neglect, alteration, improper repair, installation or improper testing.

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1. GENERAL MAINTENANCE INFORMATION

1-1. INTRODUCTION

The Atari Indy 800 game consists of a cabinet, TV monitor, printed circuit boards (PCBs), interconnecting wiring, and various cabinet-mounted circuit components. Except for a schematic, no information about the TV monitor is presented in this manual. The TV monitor is a GE 25" color unit. TV circuit malfunctions can be solved using standard TV troubleshooting techniques. However, the PCB computer requires troubleshooting techniques that may be unfamiliar to the average technician. Therefore, the troubleshooting information in this manual is dedicated to the PCBs and their associated cabinet circuitry.

1-2. NEW MACHINE SET-UP PROCEDURE

Before turning this machine on, inspect it carefully for any damage which may have occurred during shipment. Inspect both interior and exterior of the machine for any obvious damage to the cabinet or internal components. Check for cracked or broken cabinet parts, assemblies pulling loose, broken or disconnected wires, or foreign objects shorting electrical connections. After the machine has been plugged in and turned on, perform the checkout procedure.

1-3. NEW MACHINE CHECKOUT

As each new machine leaves the factory, every component and subassembly is carefully checked for proper operation. However, since parts may have been damaged or adjustments changed during shipping, the following checkout procedure must be repeated prior to placing the machine on location:

1. Inspect both the exterior and interior of the machine for obvious shipping damage such as cracked or broken cabinet parts, subassemblies broken loose, etc.
2. Carefully inspect the interior of the machine to see that all solder joints, slip-on connectors, and plug-in type connectors are firmly seated. Pay particular attention to the PCB edge connector and the fuses. Also check the connections to the coin switch, the TV monitor, the interlock switches, and all other Molex-type connectors.
3. Plug the machine in, and pull out the white actuator shafts of the interlock switches if the rear door is open. Inspect the cathode ray tube image for a steady and sharp picture that exhibits the proper levels of brightness and contrast.

4. Insert several old and new coins into the coin acceptor. No genuine coin should be rejected, and each coin insertion should step the coin counter one digit. Depress the coin rejector button to make sure that the linkage is operating smoothly.
5. Coin insertion should start the game. Check for proper game sequence, making sure that all aspects of the game are functioning correctly.
6. The interlock switch must turn off the entire machine when the rear door is opened.

1-4. Q-530 COIN ACCEPTOR: OPERATION, ADJUSTMENT & MAINTENANCE

All coin acceptors leave the factory adjusted for maximum performance. If, however, more critical adjustments are desired, or if the unit has been completely disassembled for service, the following adjustment procedure is suggested. If the coin acceptor has been removed from the machine, place it in a vertical position on a level surface. If the acceptor is still mounted on the coin door, place the coin door in a vertical position on a level surface.

1. Kicker and Separator

- a. Set the acceptor with the back of the unit facing you in the test position.
- b. Loosen the screws holding the kicker (1) and the separator (3) and move both the kicker (2) and the separator (4) as far to the right as they will go. Tighten the screws.
- c. Insert several test coins (both old and new) and note that some are returned by striking the separator.
- d. Loosen the separator screw and move the separator a slight amount to the left. Tighten the screw.
- e. Insert the test coins again and, if some of them are still returned, repeat Step d until all the coins are accepted.
- f. Loosen the kicker screw and move the locker as far to the left as it will go. Tighten the screw.
- g. Insert the test coins and note that some are returned.
- h. Loosen the kicker screw and move the kicker a slight amount to the right. Tighten the screw.
- i. Insert the coins again and, if some are still returned, repeat Step h until all the coins are accepted.
- j. Be sure that both screws are tight after the adjustments have been made.

2. The Magnet Gate

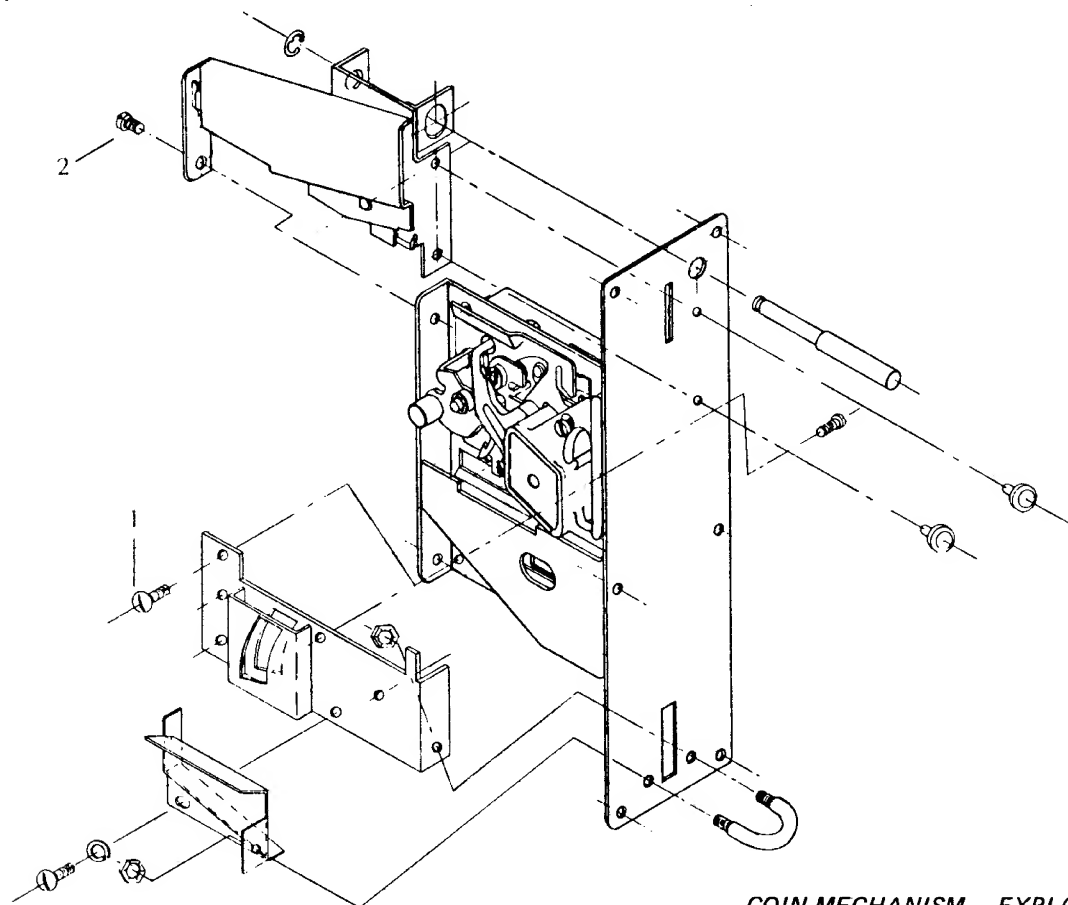
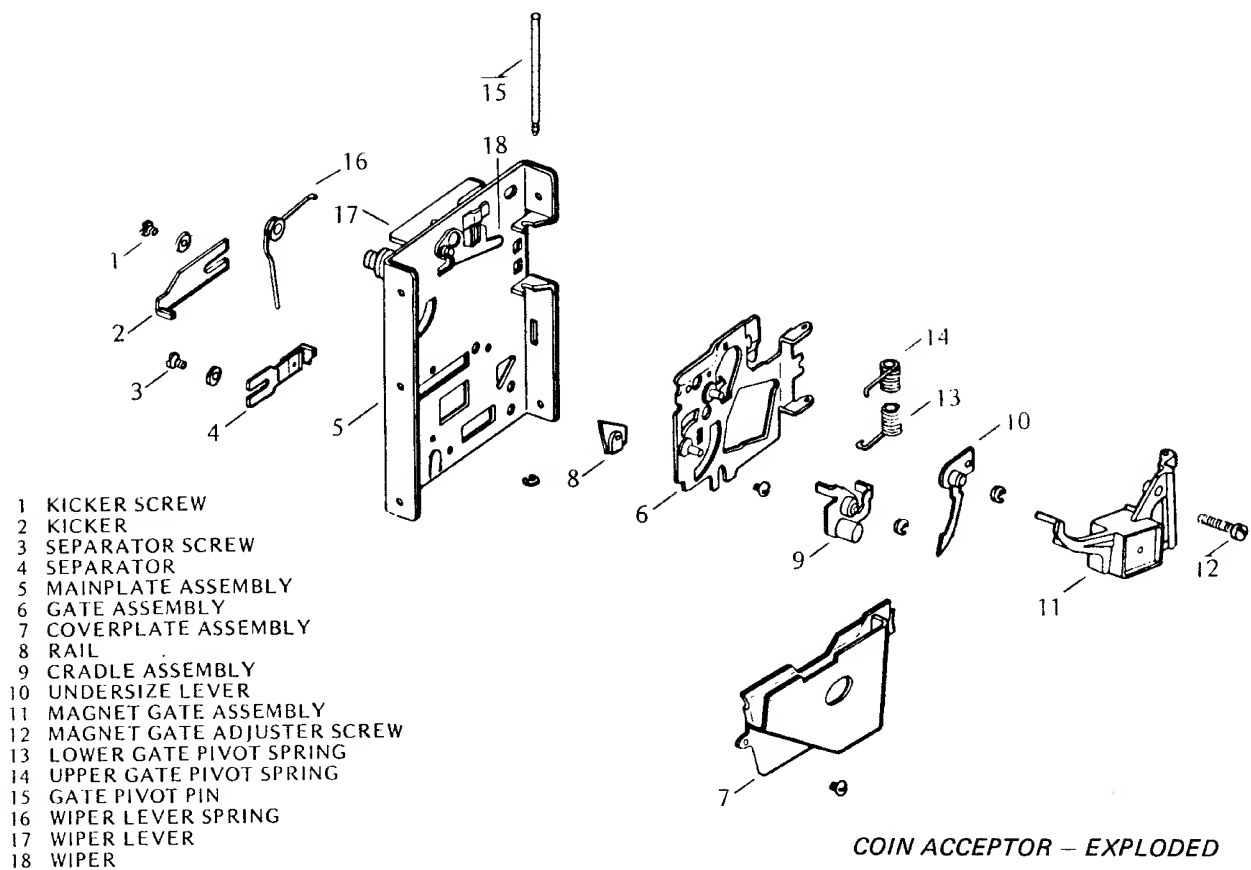
- a. Set the acceptor with the front of the unit facing you in the test position.
- b. Turn the magnet gate adjusting screw (2) out or counterclockwise until none of the coins will fit through.
- c. With a coin resting in the acceptor, turn the adjuster in or clockwise until the coin barely passes through the magnet gate.
- d. Test this adjustment using several other coins, both old and new, and if any of them fail to pass the magnet gate, repeat Step c until all the coins are accepted.
- e. Fix the magnet gate in this position with a drop of glue or Loctite[®], if necessary.

3. Acceptor Maintenance

Depending on the environment in which the acceptor is used, periodic preventive maintenance should be performed. The mainplate (5) may be cleaned with any household cleaner. Thorough rinsing and drying are necessary to remove deposits and/or film. Remove all metal particles from the magnet by guiding the point of a screwdriver or similar tool along the edges of the magnet. You will notice that the particles will cling to the point of the tool. Remove the transfer cradle (9) and the undersize lever (10) and clean the bushings and the pivot pins. A pipe cleaner is an effective cleaning tool. Apply powdered graphite or pencil lead to the pivot pins and bushings and reassemble. Spray the entire unit lightly with WD-40[®], a lubricant.

1-5. GENERAL MACHINE MAINTENANCE

Due to its solid-state circuitry, your machine will require very little maintenance other than periodic cleaning, lubrication and TV monitor adjustment. The cabinet and plexiglass screen may be cleaned with any non-abrasive household cleaner. The coin acceptor and the rejector linkage should be sprayed lightly once every three months with WD-40[®] or a silicone lubricant. The potentiometer shafts must never be lubricated in any way. The TV monitor is adjusted only when the CRT picture is distorted, or if the contrast or brightness appear to be out of adjustment.



2. CIRCUIT DESCRIPTION

2-1. GENERAL SYSTEM DESCRIPTION

1. The Indy 800 electronics system consists of the following components:

<u>Part/Assy No.</u>	<u>Qty.</u>	<u>Description</u>	<u>Section</u>	<u>Page</u>
A003182	1	Sync PCB	2-2	2-5
A003170	1	Score PCB	2-3	2-8
A003184	1	Coin control PCB	2-4	2-10
A003000	8	Car PCB	2-5	2-13
A003199	1	Backplane PCB	2-1	2-4
A003191	1	Power Supply PCB	2-6	2-19
A000607	8	Steering PCB	2-1	2-4
A003193	1	Remote panel PCB	2-4	2-11
92-013	1	25" color TV monitor	---	---
---	-	Harness & controls	---	---

The sync, score, coin control, and eight individual car boards are housed in a card rack within the game. These PCBs are interconnected by the backplane circuit board which is located at the rear of the card rack. The backplane board also provides edge connectors for interfacing with the other system components through the harness. Figure I-A shows the locations of the various boards and connectors within the card rack. The car numbers, colors, and steering wheel locations as well as locations of the card rack and power supply are shown in Figure I-B.

2. Basic functional description of each PCB

- a. Sync PCB

This includes the system clock, the video sync counters, and timing function generators, the race track video, the score checkpoints, score video windows, and the ORing circuitry for detection of collisions with other cards. The master audio volume control is also located on this board.

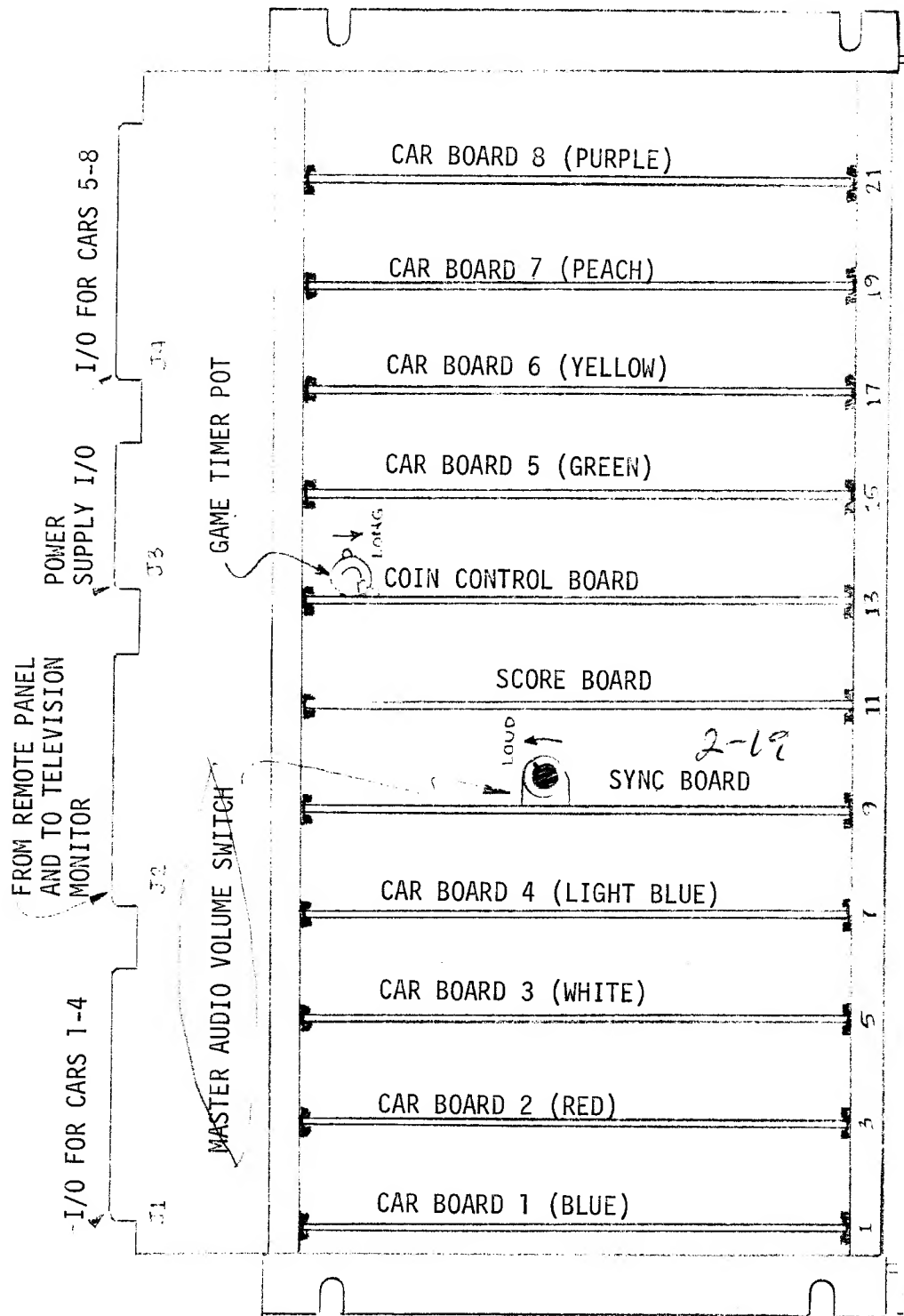


FIGURE I-A INDY 800 CARD RACK LAYOUT (FRONT VIEW)

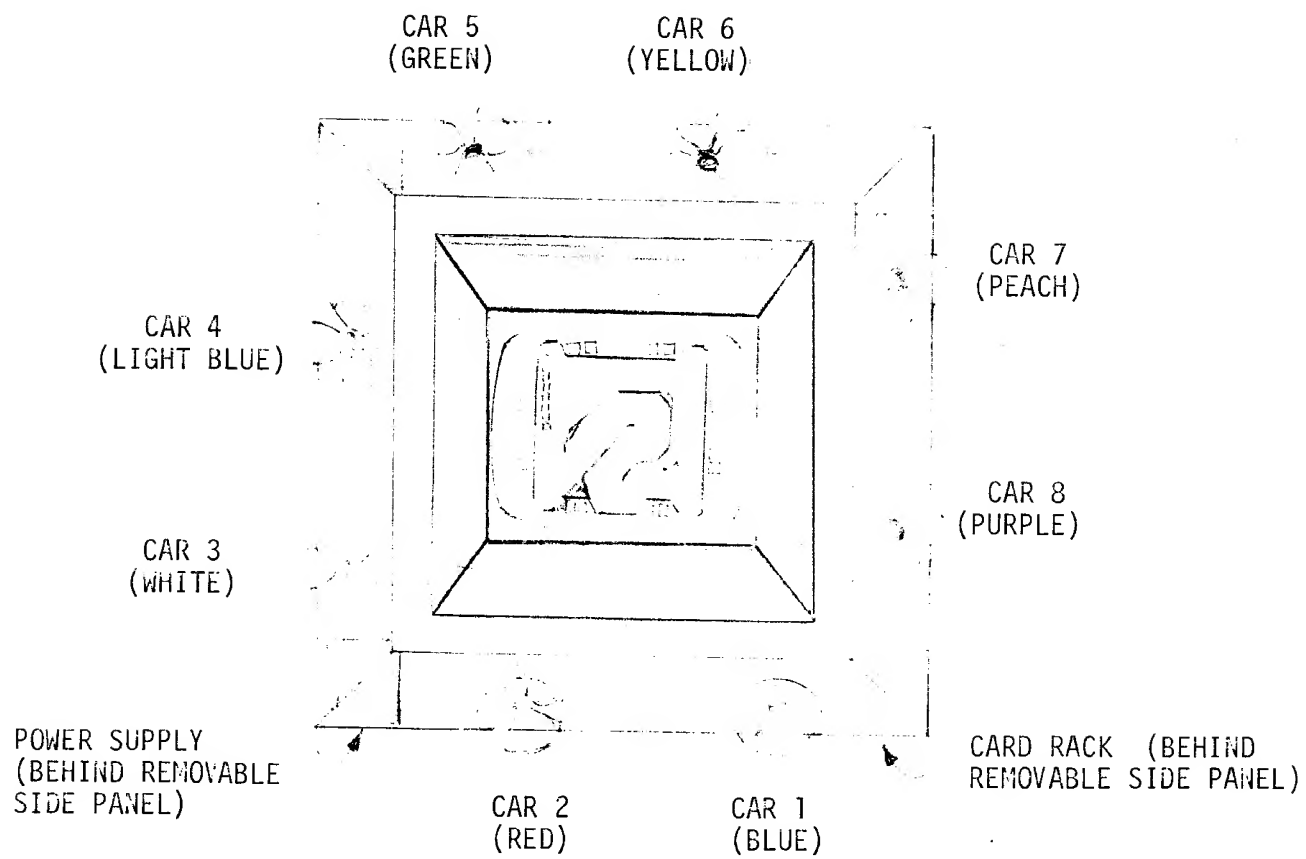


FIGURE I-B INDY 800 CABINET: LOCATION OF CAR CONTROLS AND ELECTRONICS

b. Score PCB

This includes all the circuitry necessary for detecting, counting, and displaying the score for each car. It also senses which car has the highest score and causes that score to blink. Finally, it contains the video outputs to the TV (except sync) and the TV calibration function circuit.

c. Coin control PCB

This monitors all coin inputs. It generates the reset and enable for each car in both the attended (with remote panel) and unattended (coin input, automatic) modes. The game timer and game turn-off circuitry are also included on this board.

d. 8 identical car PCBs

These control each of the individual cars. Each board contains all the circuitry necessary to rotate, move, and produce the video and audio for one car when enabled. The skid, collision, and crash detectors are also on this board.

e. Backplane board

This has no electronic components and serves only as an interface between the various components of the entire system.

f. Power supply PCB

This is the source of the unregulated power supplies for the digital and analog circuitry of the other boards. The relays and drivers for the coin mechanism lockout coils are also located on this board.

g. Steering PCBs

These are mounted on the backside of the steering wheel assemblies. The boards use optical sensing to produce two signals in quadrature, which may be decoded into rate and direction of rotation.

h. Remote panel

This is simply a switch board which is used to control the game in the attended mode of operation. Individual car enables, a master enable, and a start button are provided. When the remote panel is disconnected, the game automatically reverts to the unattended or automatic mode.

2-2. THE SYNC PRINTED CIRCUIT BOARD

The sync PCB has circuitry to produce the following functions:

1. System CLOCK and video countdown chain.
2. COMP SYNC signal to TV monitor.
3. Race track video.
4. Score CHECKPOINTS.
5. SCORE WINDOW.
6. OTHER CARS signal for each car.
7. +5 volts power for steering boards.
8. Miscellaneous timing signals to other logic.
9. MASTER VOLUME CONTROL signals.

The system CLOCK runs at 14.3 MHz. The horizontal countdown chain A4 B4, C4 (9316s) divides this basic frequency by 908 for each video line (15.76 KHz). The vertical countdown chain D4, D4 (7493), E3 (74107) divides the line rate by an additional 263 for a video frame (60 Hz).

The horizontal counter starts at 116 (binary 0001110100) and counts to 1024 (1111111111). The horizontal sync pulse (HSYNC) begins at count 256 and is 64 clock pulses wide (4.47 μ sec). This is done at C3-9 (7474) where the rising edge of 256H clocks a low through to Q, which is set back to a high 64H later by B3-11 (7400).

The vertical counter counts from zero (binary 000000000) to 262 (100000110), at which time D3-12 (7410) goes low. At the next rising edge of 512H, this low is clocked through to C3-5 (7474). VRESET then resets the vertical counters to zero and the cycle begins again after VRESET is cleared again one line later. The vertical sync pulse (VSYNC) comes from an R/S flip flop, D3-1 (7202). It begins with VRESET and is $4\frac{1}{2}$ lines long (290 sec).

The race track signal (RT) is generated by feeding sync counter signals into a 1K ROM, F4 (003189). The 4-bit output is multiplexed to a single line by F3 (74153) and is gated by 512H and by a signal to produce "dots" from A3-8 (7420).

Similarly, the score CHECKPOINTS come from a 256-bit ROM, E5 (003188) which is addressed with functions from the sync counters. The three lowest-order data outputs of this ROM are used to generate the score windows in which the score video will be shown. This generation is

accomplished in some random logic including A1 (7400), B1 (7486), and finally out of C1-8 (7420).

COMP RESET CLOCK is a signal which drives the car reset circuitry on the coin control board. It is a signal that occurs at horizontal count 544 through 1024 on one line out of every 12. D1 (74107) is hooked up as a divide-by-3 counter to produce a 4-line signal every 12 lines. B2 (7400) is hooked up as an R/S flip flip to produce the proper horizontal timing. These are ANDed together along with 1V and 2V signals to produce the required signal at C1-6 (7420).

BOUNDS is a signal that represents a horizontal boundary. It goes to the car reset circuitry on the coin control board. Any car found coincident with this signal is out of bounds and will be reset back to the starting line.

FLASH is a 4-bit (250 μ sec) square wave used to make the score of the leader blink.

16V \oplus 32H is a timing signal used in the generation of the score video. It is a digit select signal that multiplexes the high- and low-order digits of the score.

The OTHER CARS signals are a three-level ORing of every car except the one to which the signal is sent. They are used on the car boards to detect collisions between cars.

VCLOCK is a two-pulse signal during horizontal sync on each line (except those lines from 256V until the end of VSYNC). It is used to clock the vertical-motion counters on the car boards.

MASTER VOLUME signals choose one of four possible volume levels for all cars.

See Figure II-A for a diagram of the sync functions, race track, etc., as oriented on the TV screen.

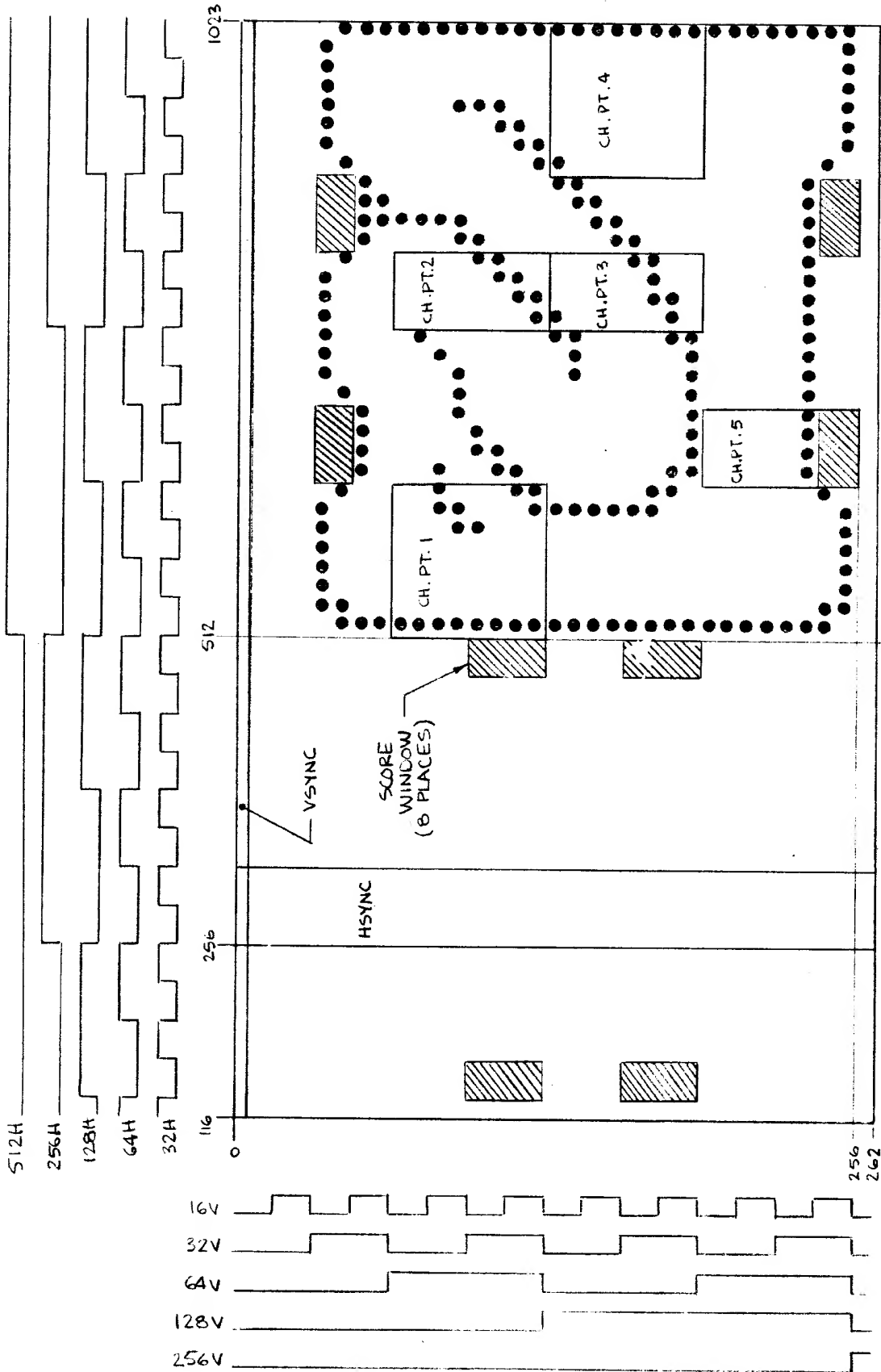


FIGURE II-A: SYNC FOR FUNCTIONING

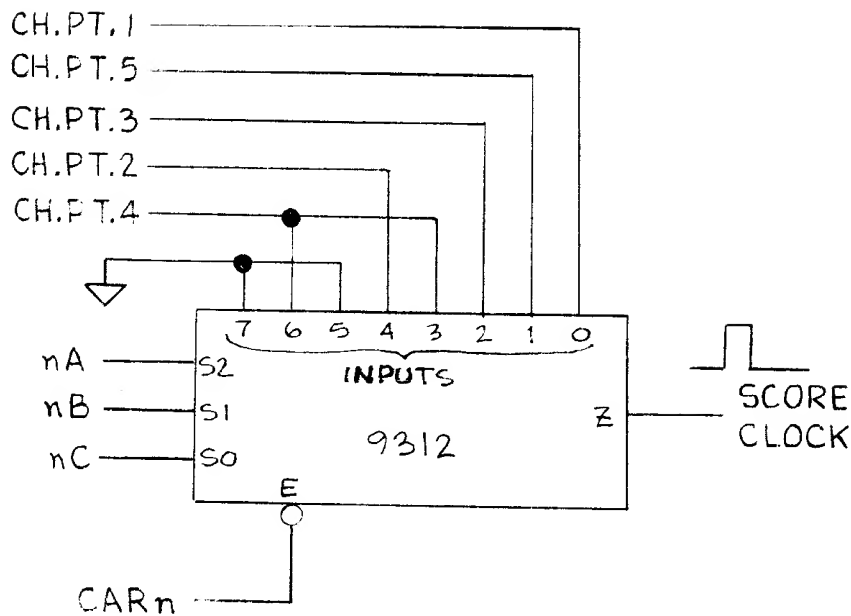
2-3. THE SCORE PRINTED CIRCUIT BOARD

The score circuit board includes several subcircuits that detect, count, and display the score as well as detect the leader. Each car has 6 bits of score arranged in two digits of 3 bits each. The three least significant bits (nC, nB, nA, where n = car number) represent an even decimal digit from zero to 8 and are the signals from the divide-by-5 outputs of a 7490 decade counter. The three most significant bits (nF, nE, nD) are the outputs of a divide-by-8 counter configuration and they represent a decimal digit from zero to 7. Thus, the score for each car runs from 00 to 78, counting by twos.

Score is detected by sensing that the car crosses a series of "checkpoints" in a certain sequence. These checkpoints are generated on the sync board and are located at appropriate places along the race course (see sync board, Section 2). The detection of coincidence between car and checkpoints in the proper sequence is provided by a 9312 IC, an eight-input multiplexer. The circuit is shown in Figure III-A. Depending on the least significant digit (3 bits) of score, the next checkpoint to be crossed is selected.

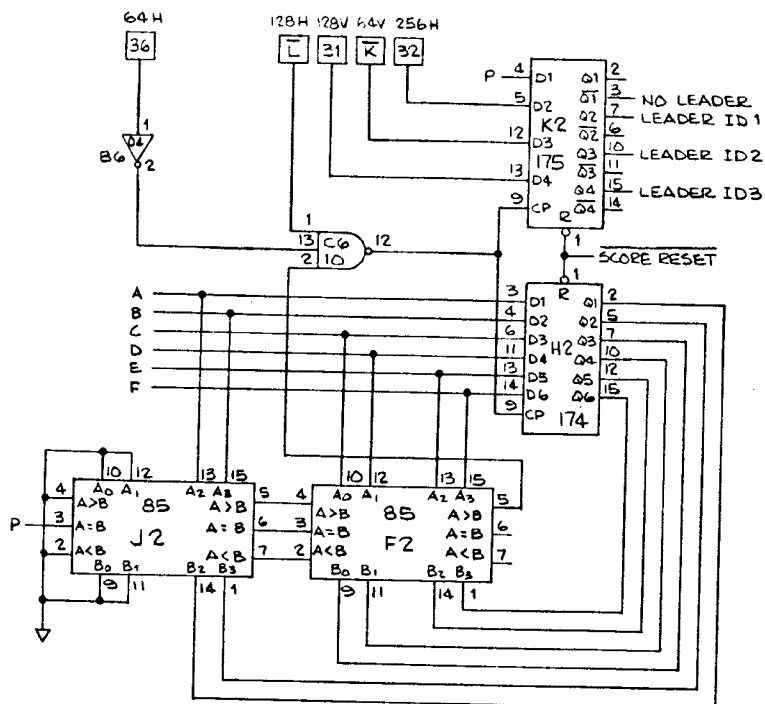
From the score counters, the score bits are time-multiplexed in another stage of six 9312s so that each score is present at the output of the multiplexers when it is to be displayed on the screen. This time-multiplexed score information is then fed into two circuits -- the leader detector circuit and the seven-segment decoder.

The leader detector circuit operates as follows (see Figure III-B). At the start of a game, all of the score counters and the latches K2 (74175) and H2 (74174) are reset. H2 contains the high score bits and K2 contains a code telling which car first achieved that score. At each video frame all the scores are compared to the highest score by comparing the multiplexed score bits (A through F) with the outputs of H2. This comparison is made in the digital comparators J2 and F2 (7485). When the incoming score exceeds the previous high score, an output of the comparator is gated with some sync signals in C6 (7410) to avoid race conditions. The resulting signal clocks H2 and K2 to store the new highest score and new-leader code.



LEAST SIGNIFICANT SCORE BITS			SELECTED CHECKPOINT
nC	nB	nA	
0	0	0	CH. PT. 1
0	0	1	2
0	1	0	3
0	1	1	4
1	0	0	CH. PT. 5

FIGURE III-A: SCORE DETECTION CIRCUIT



LEADER ID SIGNALS			NO LEADER SIGNAL	CAR IN LEAD
3	2	1		
X	X	X	1 *	NONE
0	0	0	0	1
0	0	1	0	2
0	1	0	0	3
0	1	1	0	8
1	0	0	0	4
1	0	1	0	7
1	1	0	0	6
1	1	1	0	5

* NO LEADER CONDITION IS PRESENT ONLY AT START OF GAME.

FIGURE III-B: LEADER DETECTOR CIRCUIT

The time-multiplexed score is further multiplexed into two digits in H1 (9322) and this information is fed into a seven-segment decoder, F1 (7448). A digital comparator, L2 (7485), is used to make the score of the leader blink by exciting the blanking input of F1 when the LEADER I.D. code matches the time-multiplexed sync signals (256H, 64V, 128V).

Four 74153s (A1, B1, D1, E1) and three 9312s (A2, B2, C2) are the function generators that translate the multiplexed seven-segment data into score video information. E1 and B1 form the seven-segment characters for scores 1, 2, 5, and 6. E1 (74153) forms the vertical segments b, c, e, and f. B1 (74153), together with a blanking signal from B2 (9312), forms the horizontal segments a, d, and g. These are ORed in C1 (7432): C1-11 has the video for scores 1 and 2; C1-8 has the video for scores 5 and 6. Similarly, D1 (74153) forms the vertical segments for scores 3, 4, 7, and 8, and A1 (74153) and A2 (9312) produce the horizontal segments. These are again ORed in C1 (7432): C1-6 has the video for scores 3 and 4; C1-3 has the video for scores 7 and 8. These separate video signals are remultiplexed in C2 (9312), where the score window from the sync board is used to gate the information through at the proper time.

This composite score video signal is then demultiplexed in D6 (9301) into eight separate score video signals. These signals are then ORed with the car signals in E6 and F6 (7408), ANDed with the video function SIGNAL, and sent out to the television as video information. There is some slight additional circuitry that creates video test and alignment functions on the white video output line (car 3). These functions are: normal operation, all-white screen, all-black screen (no video), and a dot pattern for convergence adjustment. They may be selected by attaching the appropriate jumper as shown on the schematic.

2-4. COIN CONTROL PRINTED CIRCUIT BOARD

The coin control circuit board contains the circuitry for the following functions:

1. Coin detection and credit latches.
2. Game control, game timer.
3. Car reset circuitry.

The heart of the coin detection and credit latch circuitry is the LM339 quad analog comparator. This device is used to sense a proper coin input and to latch and register credit for that coin until the end of the game. Normally open and normally closed coin inputs are brought into an inverter latch where the coin signal is debounced.

When the coin switch is closed, the 0.1 μ f capacitor on the non-inverting (+) terminal of the LM339 is discharged through a 68K resistor. If the switch is closed for more than 12 msec, the voltage at the non-inverting terminal of the LM339 will go negative with respect to the inverting (-) terminal voltage (ref. Voltage). When this occurs, the output of the LM339 changes state. Through positive feedback, this state is latched into the comparator. If the coin switch is closed for less than 6 msec, the capacitor will not discharge sufficiently to allow the output of the LM339 to change state. Between 6 and 12 msec, the latching may or may not take place, depending on device tolerances. The typical duration of coin pulse needed to toggle the latch is 10 msec. At the end of the game, or in case of a power or static interrupt, the REF voltage at the inverting (-) comparator input is pulled low. The output again goes high, and the 0.1 μ f capacitor is quickly recharged through a diode.

The game control circuitry determines which cars are enabled in all modes of operation. There are three basic modes of operation:

1. Unattended (automatic).
2. Attended with coin inputs, remote start.
3. Attended with remote enable and start.

In the attended mode, the remote panel is not used. In the first attended mode the start button on the remote panel is used, but the enable switches are not (they should all be turned to the "off" position). The second attended mode assumes manual collection of money by the attendant. The lockout coil switch on the power supply board should be turned to "off" so that no money can be put into the machine. The attendant then enables any or all of the cars by turning the appropriate switches on the remote panel and pushing the start button.

The coin board determines whether it is in the attended or unattended mode by seeing if the remote panel is connected to it. If the remote panel is connected, then the $\overline{\text{REMOTE}}$ signal will be low (provided by a grounded jumper in the remote connector). Otherwise $\overline{\text{REMOTE}}$ will be high or pulled up. This signal goes to a 9322 quad two-input multiplexer (D2) that selects the proper control functions for required mode of operation.

In the unattended or automatic mode of operation, if any coin has been put into the machine, CREDIT is high (from CREDIT 1, IC C5, 7430). When CREDIT goes high, the game counters K1, J1 (7493s) start counting. After eight pulses from the 1 SEC oscillator, L1 (555), the PLAY 1 latch H1-10 and K1-13 (7402) changes state and the game starts.

If the game is in the play mode and car n has credit (Qn is high), then ATTRACT n will go low (ICs H4 and F4, 7400). This enables the controls on car n so that it may be driven. During the eight-second waiting period, the $\overline{\text{SCORE RESET}}$ signal is driven low by C2-8 (7410). At the end of the game, after 128 pulses from the one-second clock, the END GAME latch H1-4 (7402) produces a pulse to reset the credit latches.

In the attended mode, the START signal clocks the CREDIT 2 flip flop at C3-11 (7474). If any coin latches are set or remote enable switches are in the "on" position, CREDIT and PLAY will go high. The score will be reset by the START signal. At the end of the game, the END GAME latch (H1) will reset the CREDIT 2 flip flop (C3) through C2-4 (7410).

The car reset circuitry resets each car at the start of the game and if it travels out of bounds. COMP RESET CLOCK shifts a series of high signals through the 8-bit parallel out-shift register, C4 (74164). As the high signal ripples through the shift register on consecutive pulses from COMP RESET CLOCK, the individual car reset clocks (CRC 1 through CRC 8) are produced. These are used to clock the car reset flip flops A3, A4, B3, B4 (7474s). If coin switch n is closed or if car n is out of bounds, the set input of car reset flip flop n will be pulsed low, and CAR RESET n will go high. If the game has credit but car n does not, then the D-input to the reset flip flop will be held high and CAR RESET n will be continuously clocked high by CRC n. As long as the CAR RESET signal is high, car n will disappear. Then credit for car n is established, CAR RESET n will be clocked low, and the car will reappear at the starting line.

2-5. CAR PRINTED CIRCUIT BOARD

The car board contains the following circuits:

1. Car steering processor.
2. Car acceleration processor.
3. Car motion counters.
4. Car video processor.
5. Crash and collision detection.
6. Sound synthesis and power amp.

The steering processor is a two-stage up/down counter (E2 and F2, 74193s) with decoding circuitry in front (E3, 7474, and E1, 7300) and the skid detector (C1, 7400) and latch (D1, 7475) after. When the circuit is enabled (attract goes low), the decoder circuitry translates a quadrature signal from the steering board into direction and rate of turn information -- see Figure V-A). \overline{VTC} on E3-13 (7474) serves as a maximum turning rate signal.

When there is a collision between cars, E1-6 (7400) forces the car to turn for the duration of the COLLISION signal at the maximum turning rate. The red LEDs on the outputs of H4-10, 12 (7414) serve only as visual indicators of the operation of the quadrature signal from the steering board. E2 and F2 (74193s) divide the rotation pulses of the decoder circuit by 128. The last five bits of this division become the rotation code R4-R0* that represents a specific car orientation. Binary 00000 is straight up; the count continues clockwise through 32 consecutive positions up to binary 11111, which is just left of straight up. The skid latch D1 (7475) contains the direction code* of the car or D4-D1 (the lowest-order direction bit is R0).

*The rotation code R4-R0 tells in which direction the car is pointed; the direction code D4-D1, R0 tells the direction of motion.

This code differs from the rotation code only when the car is in a skid. The skid condition is determined by C1 (7400). If the car is at quarter-speed or greater when the brake is depressed, or if the car collides with another car, a skid condition exists, and $\overline{\text{SKID}}$ goes low to latch the last rotation into D1.

The acceleration processor consists of some preprocessing circuitry (D3, 74153) to create acceleration and deceleration pulses, an up/down counter (C2, 74193) to count these pulses and keep track of the speed, and a circuit (D2, 7485) that translates this speed information into speed pulses in the GO signal.

With only the gas pedal depressed, the car will accelerate at the rate of one unit per 16 frames (signal from C3-6, 7420 gated with 8F at D3-4). With no pedal depressed or with only the brake depressed, the car will decelerate at the rate of one unit per eight frames. With both gas and brake pedals depressed, the car will decelerate one unit per 16 frames. The up/down counter, C2 (94193) with a fifth stage A1-5 (7407), counts these acceleration units. At speed 14 (binary 11110), C3-8 (7420) gates out any further acceleration pulses and maximum speed is attained. At speed zero, in the attract mode, or after a crash into the pylons, the STOP signal resets the counter outputs to zero. The digital comparator D2 (7485) compares the speed code (SPEED 5-SPEED 1) against frame bits (1F-16F) from B1 (7493) and A1-3 (74107). The result is shown in Figure V-B.

The motion circuit operates on the principle of the Atari patented "slipping counter" method of moving objects on a raster scan display (patent no. 3793483). The motion counters count in parallel with the sync counters on the sync board. In order to move vertically, the vertical motion counter K3 (9316), L3 (9316), and J1-5 (74107) is forced to count short (up) or long (down) with respect to the sync vertical counter. Similarly, the horizontal motion counter H3, J2, H2 (9316s) causes horizontal motion by counting short (left) or long (right) with respect to the sync horizontal counter.

Each frame in which the GO signal is high causes the motion counters to make a unit move in the direction specified by the direction code (D4-D1, R0). To move faster, GO is high more often. A table of approximate sine/

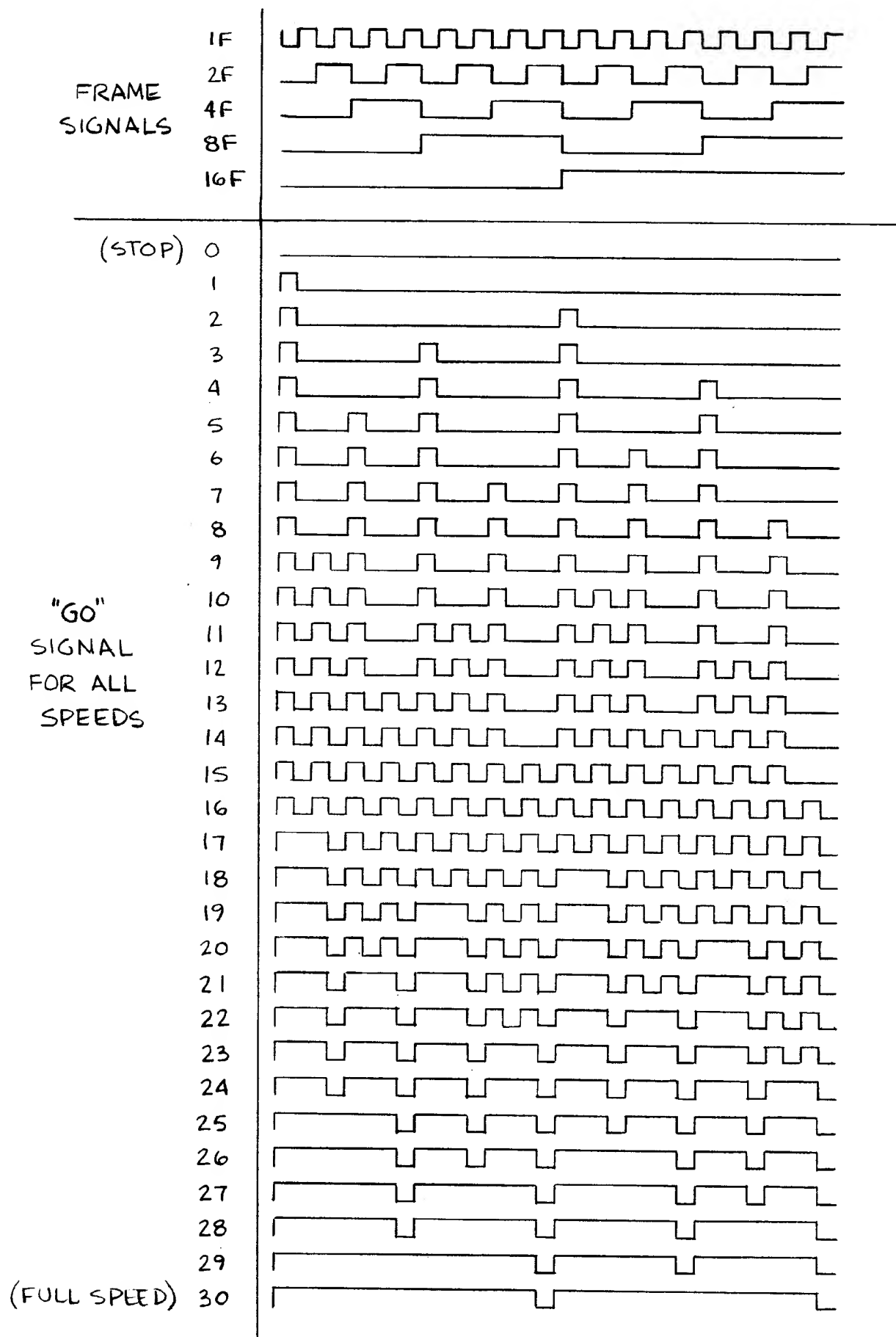


FIGURE V-B: "GO" SIGNAL (SPEED PULSES)

cosine values for the 32 different directions is contained in a PROM (K4, 003187). This motion code goes to the motion counters when G0 enables the PROM. The horizontal motion code is gated with $\overline{\text{VRESET}}$ in F3 (7402). This limits the long or short count to one line of the frame. A table of the horizontal and vertical motion codes for all 32 directions, as seen at the load inputs of H3 and K3 (9316s), is given in Table V-C. The horizontal counter is clocked at the system clock rate of 14.318 MHz. In order to maintain the same amount of motion resolution vertically as well as horizontally, the vertical motion counter is clocked by VLOCK. This signal is two pulses per line and is gated out during vertical sync so that the vertical motion counter requires one less stage. Using the terminal count outputs of the counters, a car window is formed of 16 clock pulses by 8 lines.

The video processor uses line, column, and rotation information to address video information in a 4K ROM, K2 (003186). Further column information from the horizontal motion counter is used to multiplex the ROM outputs to a single line from L2 (9312). This video is then clocked into J1-3 (74107) to remove edge effects and race problems. The result is the car video information.

When the car collides with another car, L1 (555) produces a half-second pulse during which the car will skid and spin. If the car crashes into the pylons, a low pulse is made at $\overline{\text{CRASH}}$ (H1-8), 7400). This signal stops the car and triggers the crunch sound. $\overline{\text{CRASH SEQ}}$ remains low and prevents further crashes until the car is no longer in contact with the pylons.

The sounds that are synthesized are the MOTOR SOUND, HORN, CRUNCH (crash), and SCREECH (skid). The MOTOR SOUND is produced by performing a D/A conversion on the speed code (SPEED 5-SPEED 1), and using the result to drive a current source that controls the oscillation frequency of B3 (555). This frequency is divided by both 6 and 4 and various divisions are mixed. The HORN is a 760-Hz signal gated by the horn button input. CRUNCH is made by gating noise from a noise source (D5-1, LM324) with a discrete one-shot, triggered by $\overline{\text{CRASH}}$. The SCREECH sound is formed by an op amp (D5-14, LM324) configured as a free-running multivibrator. This oscillator is also perturbed by the noise source to give it a

DIRECTION CODE D4-D1, R0	HORIZONTAL INPUTS (H3) D C B A	VERTICAL INPUTS (K3) D C B A
0 0 0 0 0	0 1 0 0	1 1 0 0
0 0 0 0 1	0 0 1 1	1 1 0 0
0 0 0 1 0	0 0 1 1	1 0 1 1
0 0 0 1 1	0 0 1 0	1 0 1 1
0 0 1 0 0	0 0 0 1	1 0 1 1
0 0 1 0 1	0 0 0 1	1 0 1 0
0 0 1 1 0	0 0 0 1	1 0 0 1
0 0 1 1 1	0 0 0 0	1 0 0 1
0 1 0 0 0	0 0 0 0	1 0 0 0
0 1 0 0 1	0 0 0 0	0 1 1 1
0 1 0 1 0	0 0 0 1	0 1 1 1
0 1 0 1 1	0 0 0 1	0 1 1 0
0 1 1 0 0	0 0 0 1	0 1 0 1
0 1 1 0 1	0 0 1 0	0 1 0 1
0 1 1 1 0	0 0 1 1	0 1 0 1
0 1 1 1 1	0 0 1 1	0 1 0 0
1 0 0 0 0	0 1 0 0	0 1 0 0
1 0 0 0 1	0 1 0 1	0 1 0 0
1 0 0 1 0	0 1 0 1	0 1 0 1
1 0 0 1 1	0 1 1 0	0 1 0 1
1 0 1 0 0	0 1 1 1	0 1 0 1
1 0 1 0 1	0 1 1 1	0 1 1 0
1 0 1 1 0	0 1 1 1	0 1 1 1
1 0 1 1 1	1 0 0 0	0 1 1 1
1 1 0 0 0	1 0 0 0	1 0 0 0
1 1 0 0 1	1 0 0 0	1 0 0 1
1 1 0 1 0	0 1 1 1	1 0 0 1
1 1 0 1 1	0 1 1 1	1 0 1 0
1 1 1 0 0	0 1 1 1	1 0 1 1
1 1 1 0 1	0 1 1 0	1 0 1 1
1 1 1 1 0	0 1 0 1	1 0 1 1
1 1 1 1 1	0 1 0 1	1 1 0 0
STOP CODE	0 1 0 0	1 0 0 0

TABLE V-C: UNIT MOTION CODES INTO MOTION COUNTERS

"gritty" quality, and it is turned on and off by the SKID signal F4-8 (7406); the sounds are then mixed, buffered, and fed into a digitally controlled four-position master attenuator. The audio volume trimpot should be adjusted so that with the horn turned on, the signal at D5-8 (LM324) is 0.75 volt peak to peak. Finally, the audio signal is amplified by the LM380 power amp.

2-6. POWER SUPPLY PRINTED CIRCUIT BOARD

The power supply board has the circuitry for the unregulated supplies and for driving the coin mechanism lockout coils.

The unregulated supplies are both full-wave center-tap rectified configurations. The +9V supply may vary from 7.5V to nearly 11V, depending on line voltage at the transformer primary and the load current. It supplies the power for the +5V regulators on the logic PCBs. The +20V supply may vary from 8V to 22V, again depending on line and load conditions. It supplies power for the audio electronics on the car boards and for the lockout coil drivers.

The lockout coil driver should be active when the \overline{LOn} signal is high, i.e., when car n has credit. This turns transistor Qn on, powers the coil of relay Kn, and applies 20V to the lockout coil on coin mechanism n (activating the coil disengages the lockout function). The diode across the relay coil shorts inductive spikes of turn-off. The diode from the emitter of the transistor to ground increases noise immunity by raising the turn-on voltage of the transistor. The 100-ohm resistor from the relay coil to +20V is a current limit resistor to limit the dissipation in the relay and the transistor.

2-7. OPERATOR ADJUSTMENTS AND OPERATING INSTRUCTIONS

1. Adjustments

There are several adjustments available to the operator. These are:

- a. Master volume switch (sync PCB).
- b. Game time adjustment (coin control PCB).
- c. Lockout coil power switch (power supply PCB).

The master volume switch adjusts the overall audio volume level to one of four possible levels. It is located on the sync PCB as shown in Figure I-A. Clockwise adjustment decreases volume; counterclockwise

adjustment increases the sound level. All of the car PCBs have their own separate volume controls. These are preset at the factory for balanced output levels and should be changed only by service personnel making repairs or adjustments to the car PCBs.

The game timer potentiometer is located on the coin control PCB in the upper corner near the front of the card rack. It adjusts the length of the game from approximately 75 seconds to nearly three minutes. Game time is increased by turning the pot downward or clockwise as seen from the front of the card rack.

The lockout coin power switch is located near the edge connector of the power supply PCB. If switched to the "off" position, all of the coils will go into the coin lockout mode, and the machine will not accept coins. This feature is useful in applications where an attendant collects payments manually and uses the remote panel to control the game. In order to use the coin mechanisms in the machine, this switch must be in the "on" position and power must be on.

2. Operating instructions

The unattended or automatic mode: after insuring that the machine is properly assembled and secure, apply power by inserting the power plug into a 105-125 VAC, 60-cycle, three-pronged or grounded receptacle rated for at least 5 amperes (600 watts). It will take a few minutes for the TV monitor to warm up. The game should come on in the attract mode (no sound or car motion). A coin in any slot will increment that coin counter, cause the lockout coil to engage, and reset that car to the starting line. After approximately eight seconds, the game will start (sound will come on and the cars may be driven). All cars that have not received credit will disappear from the TV screen. The eight-second delay allows all players to deposit their money before the game starts. Any player depositing money after the game starts will also get his car reset to the starting line and may play for the remainder of the game. The lockout coil power switch must be on, and the remote panel must be disconnected for this mode of operation.

The attended mode or using the remote panel; with power off (power cord disconnected), remove the side access panel. Guide the remote panel cable through the power cord outlet hole and into the machine. Connect the cable to the mating connector coming from the main harness just left of the card rack. If the coin mechanisms are to be used, the lockout coil power switch should be in the "on" position; it should be off if money will be collected manually. Put the access panel back into place. After insuring that the game is properly assembled and secure and that all toggle switches on the remote panel are in the "off" or downward position, apply power of 105-125 VAC, 60 cycles, 5 amperes, third terminal grounded.

If the coin mechanisms are used for money collection, the game will perform as in the automatic mode, except that to start the game the start button on the remote panel is used. All toggle switches on the remote panel should be in the "off" position at all times in this mode.

If money is collected manually, the cars for which payment has been received are enabled by toggling the appropriate switches on. Optionally, if all cars are to be enabled, the master switch in the center of the remote panel may be switched on. The game may be stopped at any time by disabling all the cars -- if a restart is desired or if a contest for a certain number of laps is desired. To start a game after setting the switches to their proper positions, push the "start" button.

2-8. SERVICE AND TROUBLESHOOTING

Indy 800 is sold with spare circuit boards for all boards in the card rack and one spare steering PCB. When inserting circuit boards into the card rack, take the following steps to insure that the game will not be damaged:

1. Be certain that the board is the proper type for that position and that it is not reversed. See Figure I-A for location of board types. Heatsinks should always be at the top of the board and to the right.
2. Be certain that the board is inserted straight into position in the card guides.

3. Pushing gently, wobble the board slightly until it begins to seat into the connector. If it does not begin to seat, recheck steps 1 and 2 and check for warpage of the board. Correct any problem.
4. Applying firm, constant pressure, push the board into place until it is seating fully. The front edge of the board should be flush with adjacent circuit boards. DO NOT use fast, jerky motions, as this could damage the backplane board or the edge connector.

When removing boards, always use the card ejector tool provided with the game. Hook the bolt of the tool into the hole in the uppermost corner of the circuit board. Using the frame of the card rack as a pivot, pull gently up to disengage the card from the backplane (see Figure VIII-A). Remove the ejector tool and pull the card out by hand.

When troubleshooting, the short description of each board in Section 1 should be a great help in quickly locating a problem. Replacing the suspect circuit board with a replacement gives quick verification of the source of the problem. To fix a circuit board, refer to the schematic and technical description provided in this manual. Repair of circuit boards should be attempted only by qualified technical personnel with proper equipment. As an additional aid to maintenance, the system has been designed so that all eight car PCBs are interchangeable. Also, removing one car board will only disable that car, without affecting any others.

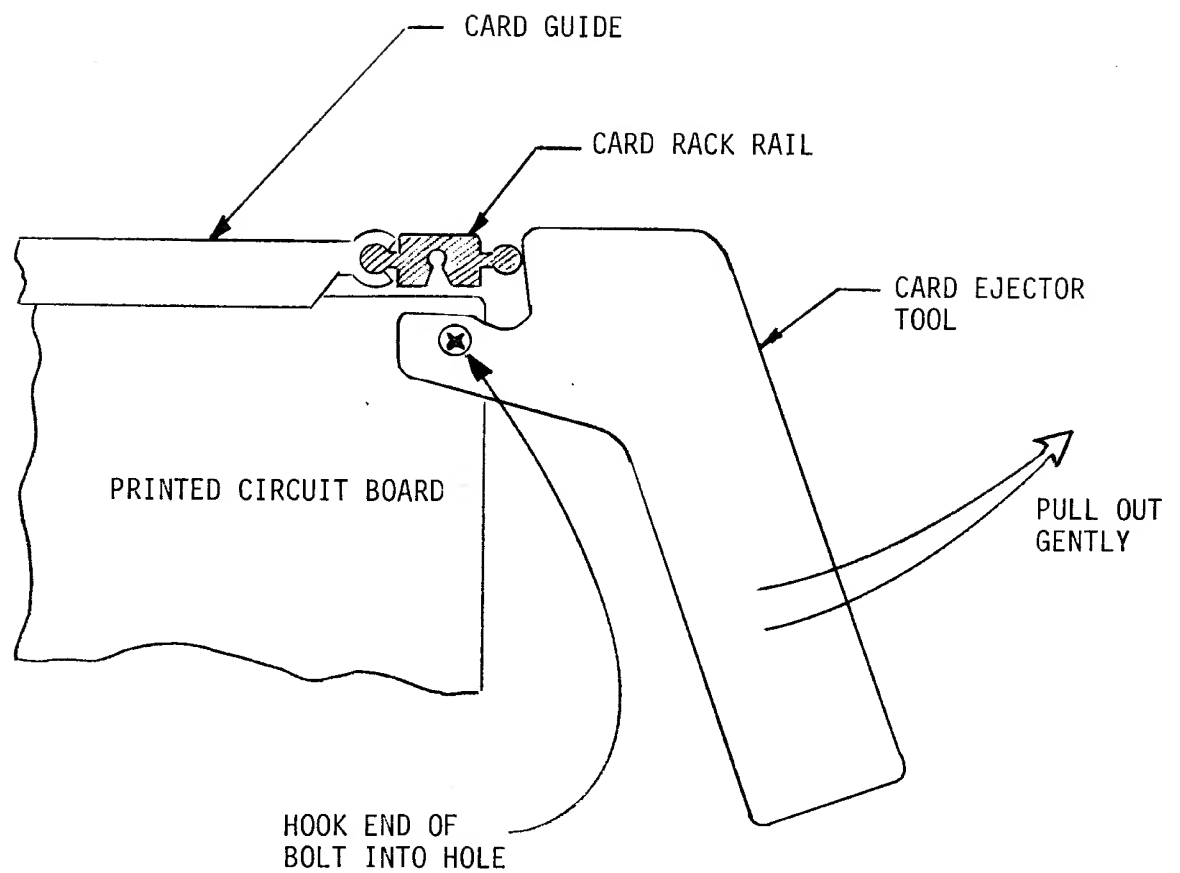


FIGURE VIII-A USE OF THE CARD EJECTOR TOOL

3. CUSTOMER SERVICE INFORMATION

3-1. TEST EQUIPMENT

In order to test any Atari PCB, some items such as the logic probe are absolutely essential. Others are desirable and will make the test procedure easier but are not absolutely essential. Some of these instruments are available from the Atari Customer Service Department and these are: the Kurz-Kasch 520 Logic Probe, the Atari Video Probe and the Hewlett-Packard 10529A Logic Comparator. Other instruments that are very useful are the HP 10526T Logic Pulser and the Tektronix 465 Oscilloscope. These items are available through your local electronics supply house.

3-2. REQUIRED MINIMUM EQUIPMENT

The following items are absolutely essential to perform the test procedures presented in this manual:

1. Logic Probe: The logic probe is an instrument designed for checking the outputs of integrated circuits. The Kurz-Kasch Logic Probe, Model No. LP-520, which is available through the Atari Customer Service Department or most large electronics supply houses, is recommended. This logic probe indicates if a signal is logic high, logic low, or changing from one state to another. Consult the operating instructions included with the probe for further details about its operation.
2. Video Probe: The video probe is a very simple but extremely useful device and consists of two test clips, a length of rubber-coated, test lead wire, and a 4.7K, $\frac{1}{4}$ -watt carbon resistor. Video probes may be obtained from the Atari Customer Service Department or, if necessary, they can be assembled from standard components available at all electronics supply houses.

3-3. OPTIONAL EQUIPMENT

It is possible to find 90% of the possible PCB computer malfunctions without the following items. However, if a complete set of troubleshooting equipment is desired, Atari recommends:

1. Hewlett-Packard 10529A Logic Comparator

The Hewlett-Packard 10529A Logic Comparator is used to verify correct IC operation. This device simply clips onto in-circuit ICs and instantly displays any logic state difference between the in-circuit test IC and the reference IC in the comparator. Logic differences for each pin of a 14 or 16 dual in-line package are indicated by a lamp on the comparator. If the logic comparator is purchased from the Atari Customer Service Department, it is shipped with 20 preprogrammed reference PCBs. If the device is purchased elsewhere, these PCBs must be specially programmed.

2. Hewlett-Packard 10526T Logic Pulser

The Hewlett-Packard 10526T Logic Pulser is used to stimulate in-circuit ICs so that they are driven to their opposite states. This device is available from the Atari Customer Service Department or can be obtained from most large electronics supply houses.

3. Tektronix 465 Oscilloscope

The Tektronix 465 Oscilloscope is used for viewing various wave forms and should be ordered from Tektronix. Consult the manufacturer's operating instructions for details on oscilloscope operation.

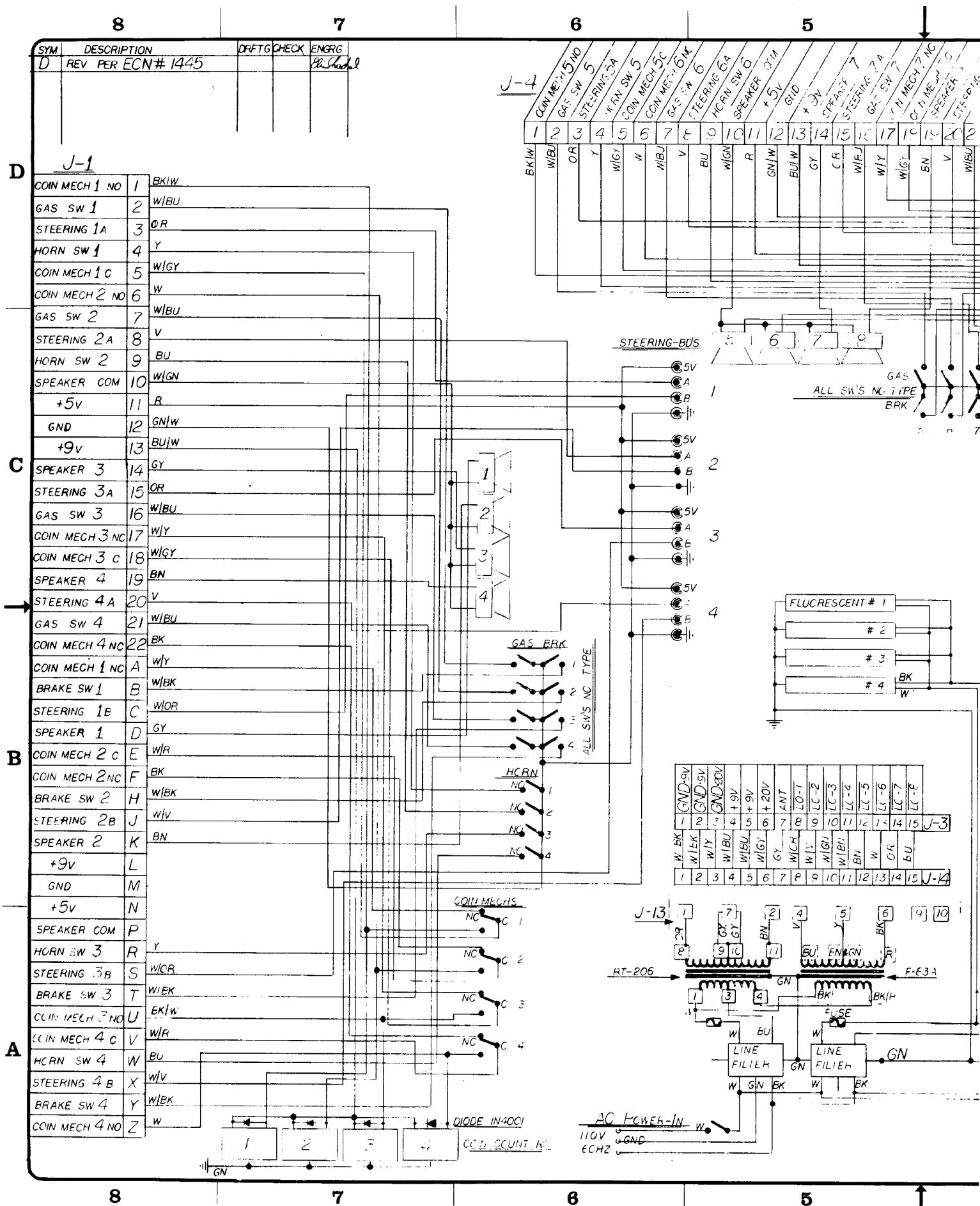
3-4. LOGIC TYPES AND FUNCTIONS

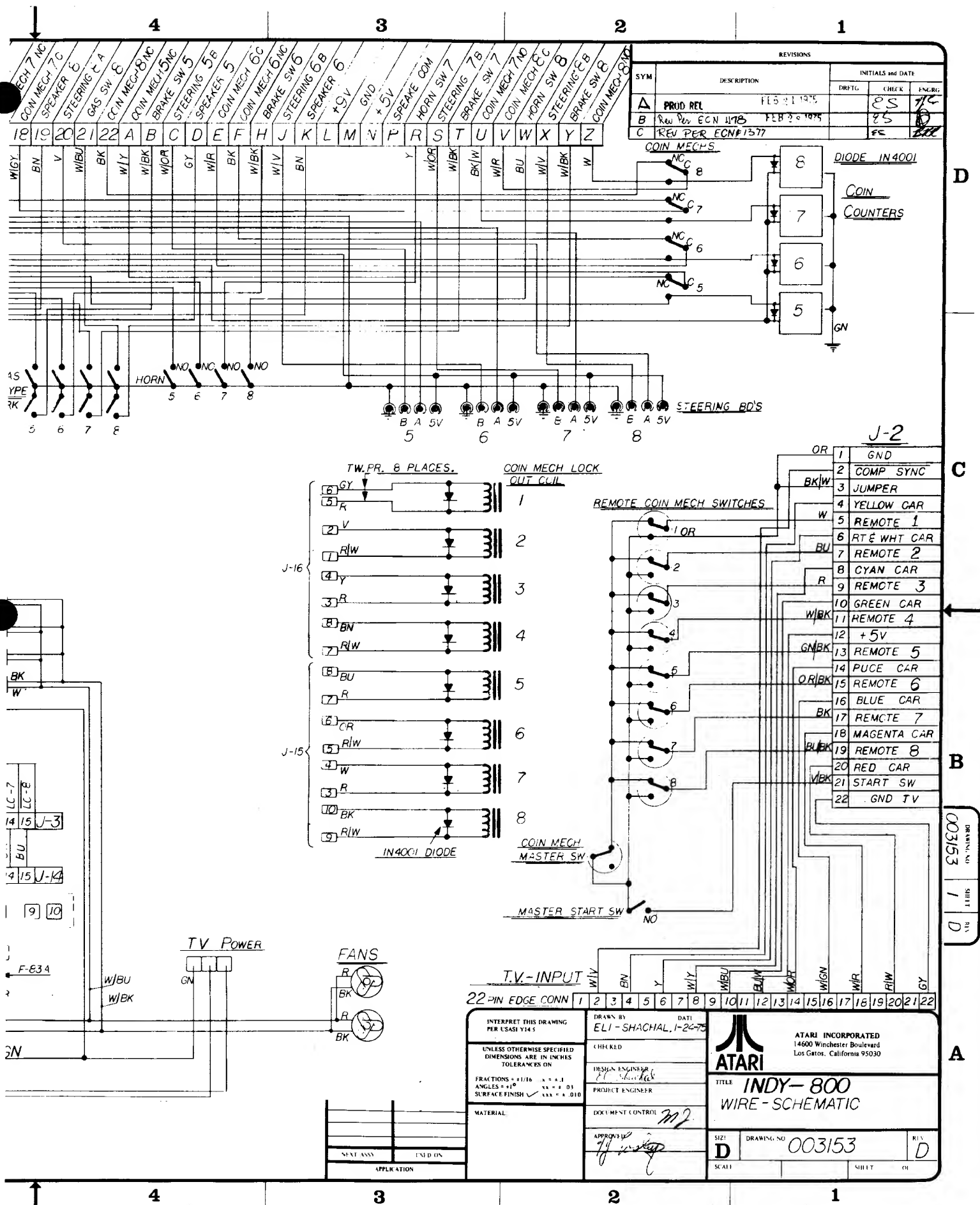
<u>TYPE</u>	<u>FUNCTION</u>
7400	QUAD 2-INPUT NAND GATE
7402	QUAD 2-INPUT NOR GATE
7404	HEX INVERTER
74S04	HEX INVERTER
7408	QUAD 2-INPUT AND GATE
7410	TRIPLE 3-INPUT NAND GATE
7413	DUAL NAND SCHMITT TRIGGER
7420	DUAL 4-INPUT NAND GATE
7425	DUAL 4-INPUT NOR WITH STROBE
7427	TRIPLE 3-INPUT NOR GATE
7430	SINGLE 8-INPUT NAND GATE
7448	BCD TO 7-SEGMENT DECODER
7450	DUAL AND/OR GATE (INVERTER/EXPANDER)
7474	DUAL D FLIP FLOP
7483	4-BIT FULL ADDER
7486	QUAD EXCLUSIVE OR GATE
7490	DECADE COUNTER
7492	DIVIDE-BY-12 COUNTER
7493	4-BIT BINARY COUNTER
74107	DUAL JK M/S FLIP FLOP
74153	DUAL 4-BIT MULTIPLEXER
74157	QUAD 2-INPUT DATA SELECTOR/MULTIPLEXER
74165	PARALLEL-LOAD 8-BIT SHIFT REGISTER
74192	SYNCHRONOUS DECADE UP/DOWN COUNTER

74193	SYNCHRONOUS BINARY UP/DOWN COUNTER
LM380	AMPLIFIER
NE555	TIMER
NE566	FUNCTION GENERATOR
747	DUAL OPERATIONAL AMPLIFIER
RC4136D	QUAD OPERATIONAL AMPLIFIER
MFC6040	VOLTAGE-CONTROLLED OPERATIONAL AMPLIFIER
8098	HYBRID
8103	HYBRID
8099	HYBRID
9311	ONE-OF-SIXTEEN DECODER/DEMULTIPLEXER
9312	8-INPUT MULTIPLEXER
9314	QUAD LATCH
9316	4-BIT BINARY COUNTER
9321	DUAL ONE-OF-FOUR DECODER
9602	DUAL MONOSTABLE MULTIVIBRATOR
74186	ROM

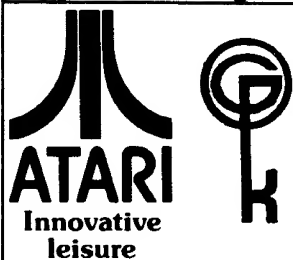
SECTION 4.

SCHEMATICS, DRAWINGS AND PARTS LISTS





INTERPRET THIS DRAWING PER USASI Y14.5 UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS $\pm .010$ $\pm .005$ $\pm .002$ ANGLES $\pm 1^\circ$ $\pm .5^\circ$ $\pm .2^\circ$ SURFACE FINISH $\sqrt{\text{A}}$ $\sqrt{\text{B}}$ $\sqrt{\text{C}}$		DRAWN BY ELI - SHACHAL, 1-24-75 CHECKED DESIGN ENGINEER PROJECT ENGINEER DOCUMENT CONTROL APPROVED 7/5		DATE 1-24-75 TITLE INDY-800 WIRE - SCHEMATIC SIZE D SCALE DRAWING NO 003153 SHEET 1 OF 1	
MATERIAL SEAT ASSY USED ON APPLICATION		ATARI INCORPORATED 14600 Winchester Boulevard Los Gatos, California 95030			



ASSEMBLY TITLE / INDY 800 CABINET TOP - TOP ASSY **P/L** A002970

PARTS LIST SPECIFICATION

Page 1 of 1

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Mech. Eng.

Proj. Eng.

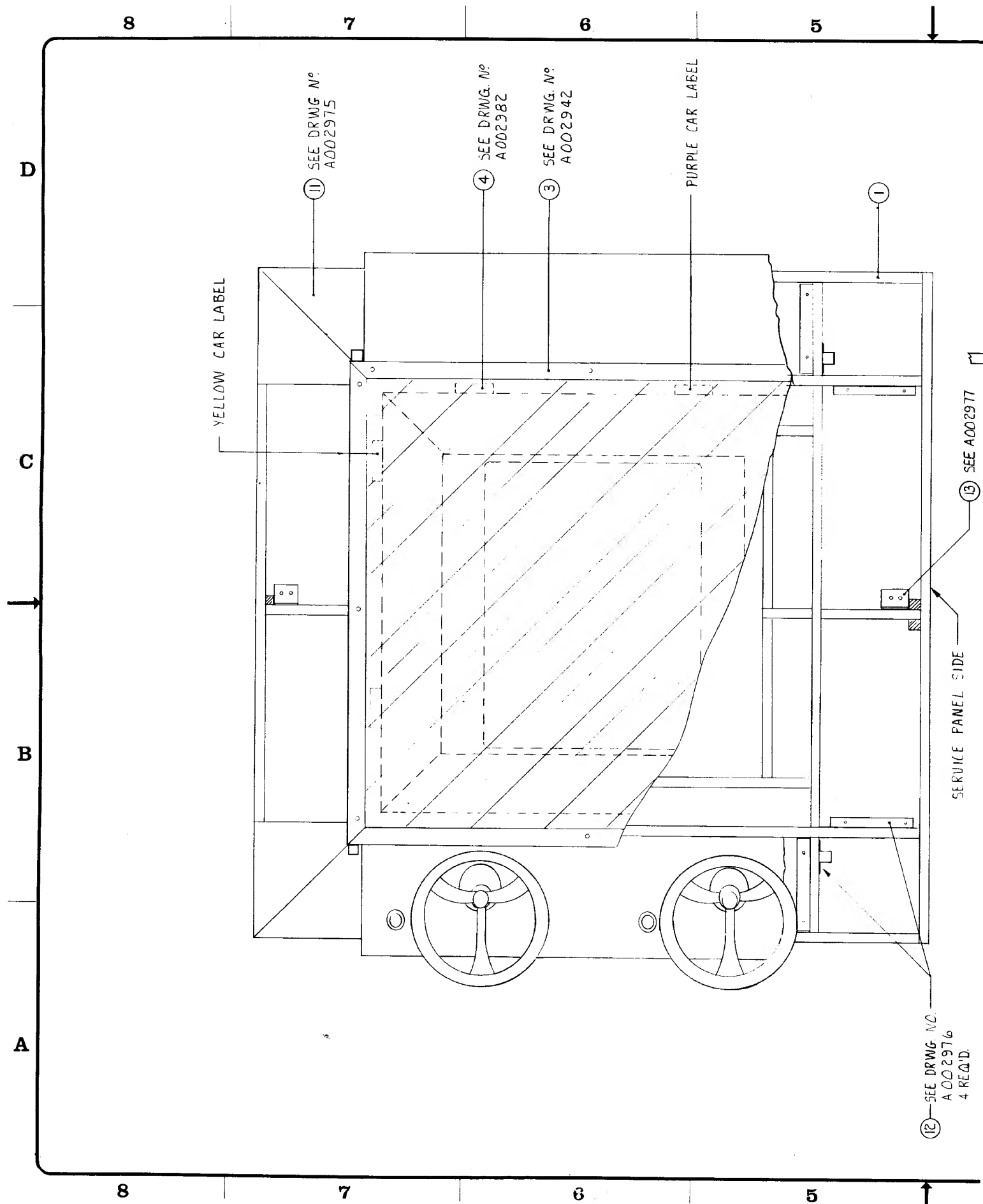
Elec. Eng

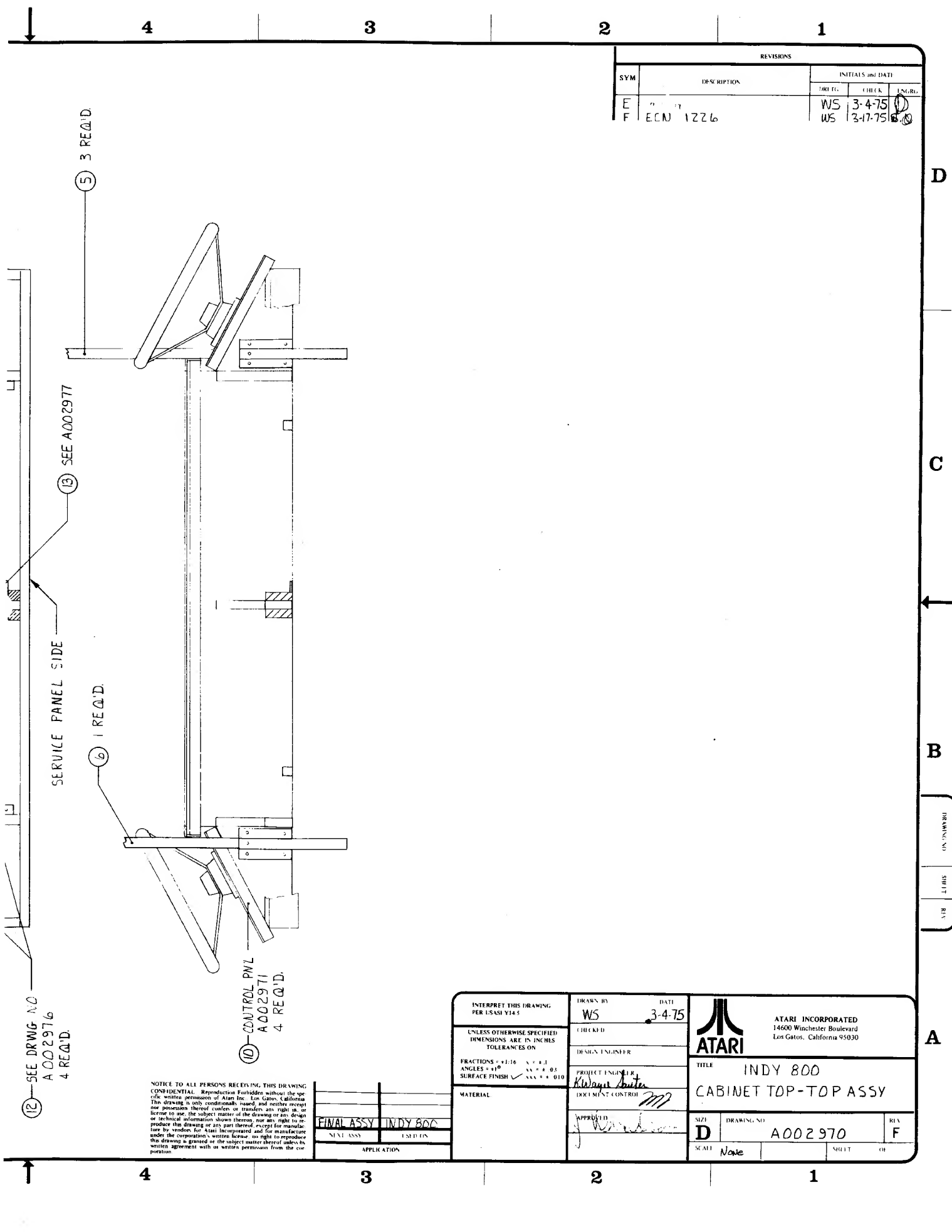
REV.



F

Rev.	Description	Date	Apprv.	Rev.	Description	Date	Apprv.
A	Production Release	2-3-75	<i>7/12</i>				
B	Rev per ECN 1112	2-7-75	<i>7/12</i>				
C	Rev per ECN 1121	2/11/75	<i>7/12</i>				
D	" " " 1130	2/14/75	<i>8/6/75</i>				
E	" " " 1152	2/26/75					
F	" " " 1226	3/17/75					

Item	Part Number	Qty.	DESCRIPTION
1	A002892	REF	Cabinet Top Frame Assy
2			
3	A002942	1	Plexiglass cover - Retainer Assy
4	A003337	1	Car Label & Instruction Card Assy
5	002921-01	3	Long Steel Leg
6	002921-02	1	Long Steel Leg with Detail
7			
8			
9			
10	A002971	4	Control Panel Assy
11	A002975	1	ABS Corner Cap Assy
12	A002976	1	Corner Brkt & Leg Brkt & Control Panel Brkt Assy
13	A002977	2	Top - Tie Down Brkt Assy





REVISIONS				
SYM	DESCRIPTION	INITIALS and DATE		
		DRG.	CHK.	ENG.
E		WS	3-4-75	
F	ECN 1226	WS	3-17-75	

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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON		CHECKED		ATARI	
FRACTIONS = 1/16 1/8 1/4 1/2 3/4 1 1 1/2 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 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1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044 1045 1046 1047 1048 1049 1050 1051 1052 1053 1054 1055 1056 1057 1058 1059 1060 1061 1062 1063 1064 1065 1066 1067 1068 1069 1070 1071 1072 1073 1074 1075 1076 1077 1078 1079 1080 1081 1082 1083 1084 1085 1086 1087 1088 1089 1090 1091 1092 1093 1094 1095 1096 1097 1098 1099 1100 1101 1102 1103 1104 1105 1106 1107 1108 1109 1110 1111 1112 1113 1114 1115 1116 1117 1118 1119 1120 1121 1122 1123 1124 1125 1126 1127 1128 1129 1130 1131 1132 1133 1134 1135 1136 1137 1138 1139 1140 1141 1142 1143 1144 1145 1146 1147 1148 1149 1150 1151 1152 1153 1154 1155 1156 1157 1158 1159 1160 1161 1162 1163 1164 1165 1166 1167 1168 1169 1170 1171 1172 1173 1174 1175 1176 1177 1178 1179 1180 1181 1182 1183 1184 1185 1186 1187 1188 1189 1190 1191 1192 1193 1194 1195 1196 1197 1198 1199 1200 1201 1202 1203 1204 1205 1206 1207 1208 1209 1210 1211 1212 1213 1214 1215 1216 1217 1218 1219 1220 1221 1222 1223 1224 1225 1226 1227 1228 1229 1230 1231 1232 1233 1234 1235 1236 1237 1238 1239 1240 1241 1242 1243 1244 1245 1246 1247 1248 1249 1250 1251 1252 1253 1254 1255 1256 1257 1258 1259 1260 1261 1262 1263 1264 1265 1266 1267 1268 1269 1270 1271 1272 1273 1274 1275 1276 1277 1278 1279 1280 1281 1282 1283 1284 1285 1286 1287 1288 1289 1290 1291 1292 1293 1294 1295 1296 1297 1298 1299 1300 1301 1302 1303 1304 1305 1306 1307 1308 1309 1310 1311 1312 1313 1314 1315 1316 1317 1318 1319 1320 1321 1322 1323 1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338 1339 1340 1341 1342 1343 1344 1345 1346 1347 1348 1349 1350 1351 1352 1353 1354 1355 1356 1357 1358 1359 1360 1361 1362 1363 1364 1365 1366 1367 1368 1369 1370 1371 1372 1373 1374 1375 1376 1377 1378 1379 1380 1381 1382 1383 1384 1385 1386 1387 1388 1389 1390 1391 1392 1393 1394 1395 1396 1397 1398 1399 1400 1401 1402 1403 1404 1405 1406 1407 1408 1409 1410 1411 1412 1413 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1614 1615 1616 1617 1618 1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629 1630 1631 1632 1633 1634 1635 1636 1637 1638 1639 1640 1641 1642 1643 1644 1645 1646 1647 1648 1649 1650 1651 1652 1653 1654 1655 1656 1657 1658 1659 1660 1661 1662 1663 1664 1665 1666 1667 1668 1669 1670 1671 1672 1673 1674 1675 1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1686 1687 1688 1689 1690 1691 1692 1693 1694 1695 1696 1697 1698 1699 1700 1701 1702 1703 1704 1705 1706 1707 1708 1709 1710 1711 1712 1713 1714 1715 1716 1717 1718 1719 1720 1721 1722 1723 1724 1725 1726 1727 1728 1729 1730 1731 1732 1733 1734 1735 1736 1737 1738 1739 1740 1741 1742 1743 1744 1745 1746 1747 1748 1749 1750 1751 1752 1753 1754 1755 1756 1757 1758 1759 1760 1761 1762 1763 1764 1765 1766 1767 1768 1769 1770 1771 1772 1773 1774 1775 1776 1777 1778 1779 1780 1781 1782 1783 1784 1785 1786 1787 1788 1789 1790 1791 1792 1793 1794 1795 1796 1797 1798 1799 1800 1801 1802 1803 1804 1805 1806 1807 1808 1809 1810 1811 1812 1813 1814 1815 1816 1817 1818 1819 1820 1821 1822 1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1843 1844 1845 1846 1847 1848 1849 1850 1851 1852 1853 1854 1855 1856 1857 1858 1859 1860 1861 1862 1863 1864 1865 1866 1867 1868 1869 1870 1871 1872 1873 1874 1875 1876 1877 1878 1879 1880 1881 1882 1883 1884 1885 1886 1887 1888 1889 1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903 1904 1905 1906 1907 1908 1909 1910 1911 1912 1913 1914 1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 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2214 2215 2216 2217 2218 2219 2220 2221 2222 2223 2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234 2235 2236 2237 2238 2239 2240 2241 2242 2243 2244 2245 2246 2247 2248 2249 2250 2251 2252 2253 2254 2255 2256 2257 2258 2259 2260 2261 2262 2263 2264 2265 2266 2267 2268 2269 2270 2271 2272 2273 2274 2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289 2290 2291 2292 2293 2294 2295 2296 2297 2298 2299 2300 2301 2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321 2322 2323 2324 2325 2326 2327 2328 2329 2330 2331 2332 2333 2334 2335 2336 2337 2338 2339 2340 2341 2342 2343 2344 2345 2346 2347 2348 2349 2350 2351 2352 2353 2354 2355 2356 2357 2358 2359 2360 2361 2362 2363 2364 2365 2366 2367 2368 2369 2370 2371 2372 2373 2374 2375 2376 2377 2378 2379 2380 2381 2382 2383 2384 2385 2386 2387 2388 2389 2390 2391 2392 2393 2394 2395 2396 2397 2398 2399 2400 2401 2402 2403 2404 2405 2406 2407 2408 2409 2410 2411 2412 2413 2414 2415 2416 2417 2418 2419 2420 2421 2422 2423 2424 2425 2426 2427 2428 2429 2430 2431 2432 2433 2434 2435 2436 2437 2438 2439 2440 2441 2442 2443 2444 2445 2446 2447 2448 2449 2450 2451 2452 2453 2454 2455 2456 2457 2458 2459 2460 2461 2462 2463 2464 2465 2466 2467 2468 2469 2470 2471 2472 2473 2474 2475 2476 2477 2478 2479 2480 2481 2482 2483 2484 2485 2486 2487 2488 2489 2490 2491 2492 2493 2494 2495 2496 2497 2498 2499 2500 2501 2502 2503 2504 2505 2506 2507 2508 2509 2510 2511 2512 2513 2514 2515 2516 2517 2518 2519 2520 2521 2522 2523 2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2539 2540 2541 2542 2543 2544 2545 2546 2547 2548 2549 2550 2551 2552 2553 2554 2555 2556 2557 2558 2559 2560 2561 2562 2563 2564 2565 2566 2567 2568 2569 2570 2571 2572 25					



ASSEMBLY TITLE / INDY 800 TOP DISPLAY TOP ASSY P/L A002969

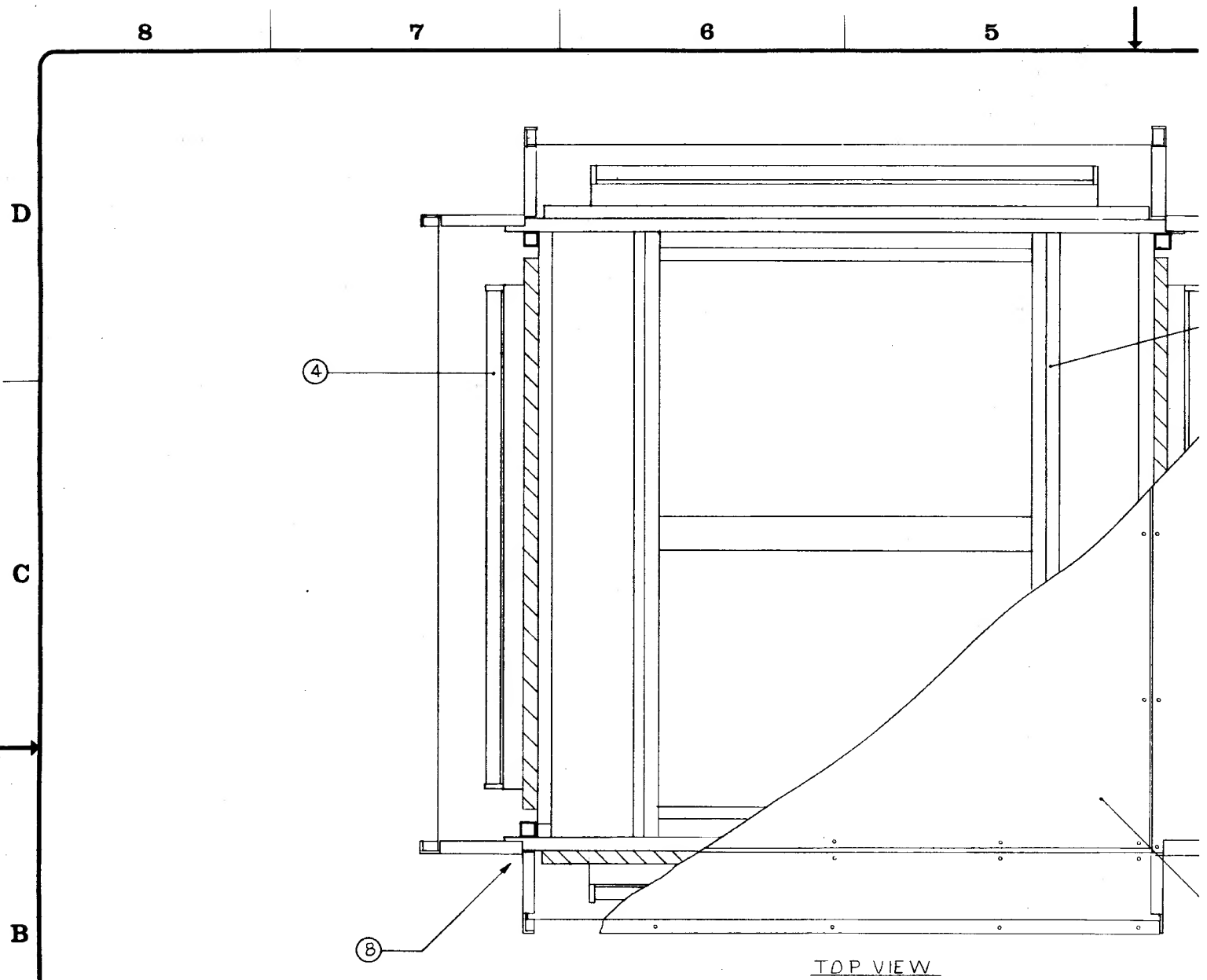
PARTS LIST SPECIFICATION

Page 1 of 1

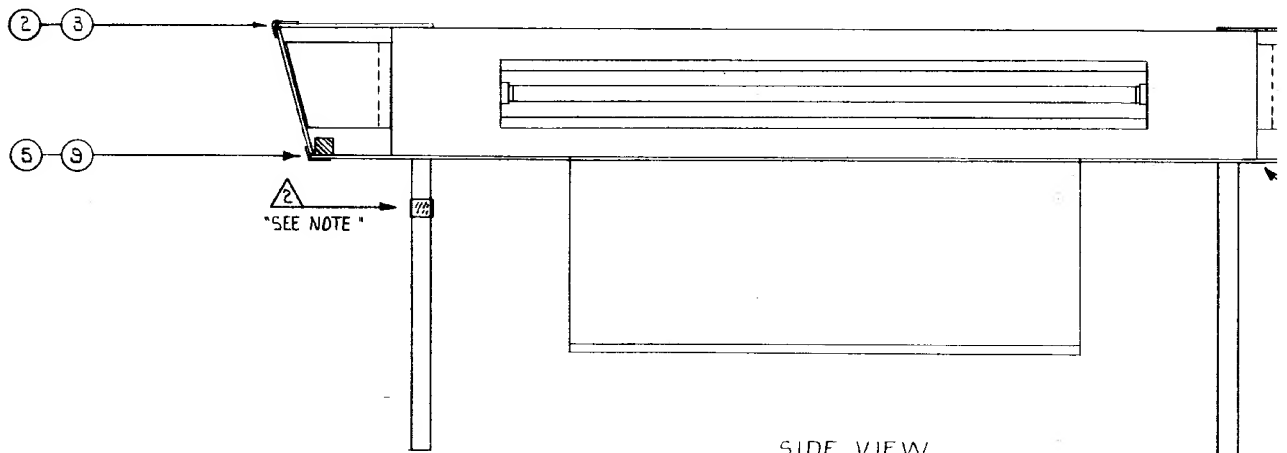
Drawn			REV. G
Checked	2/11/75	Mech. Eng. <i>J. E. S.</i>	
Proj. Eng.	Wayne Dauter	Elec. Eng.	

Rev.	Description	Date	Apprv.	Rev.	Description	Date	Apprv.
A	Production Release	2-3-75	<i>J. E. S.</i>				
B	Rev per ECN 1112	2-6-75	<i>J. E. S.</i>				
C	Rev per ECN 1121	2/11/75	<i>J. E. S.</i>				
D	REV PER ECN 1125	2/14/75	<i>J. E. S.</i>				
E	Rev per ECN 1242	3/18/75					
F	Rev per ECN 1271	3/25/75	<i>J. E. S.</i>				
G	Rev per ECN 1315	4/14/75	<i>J. E. S.</i>				

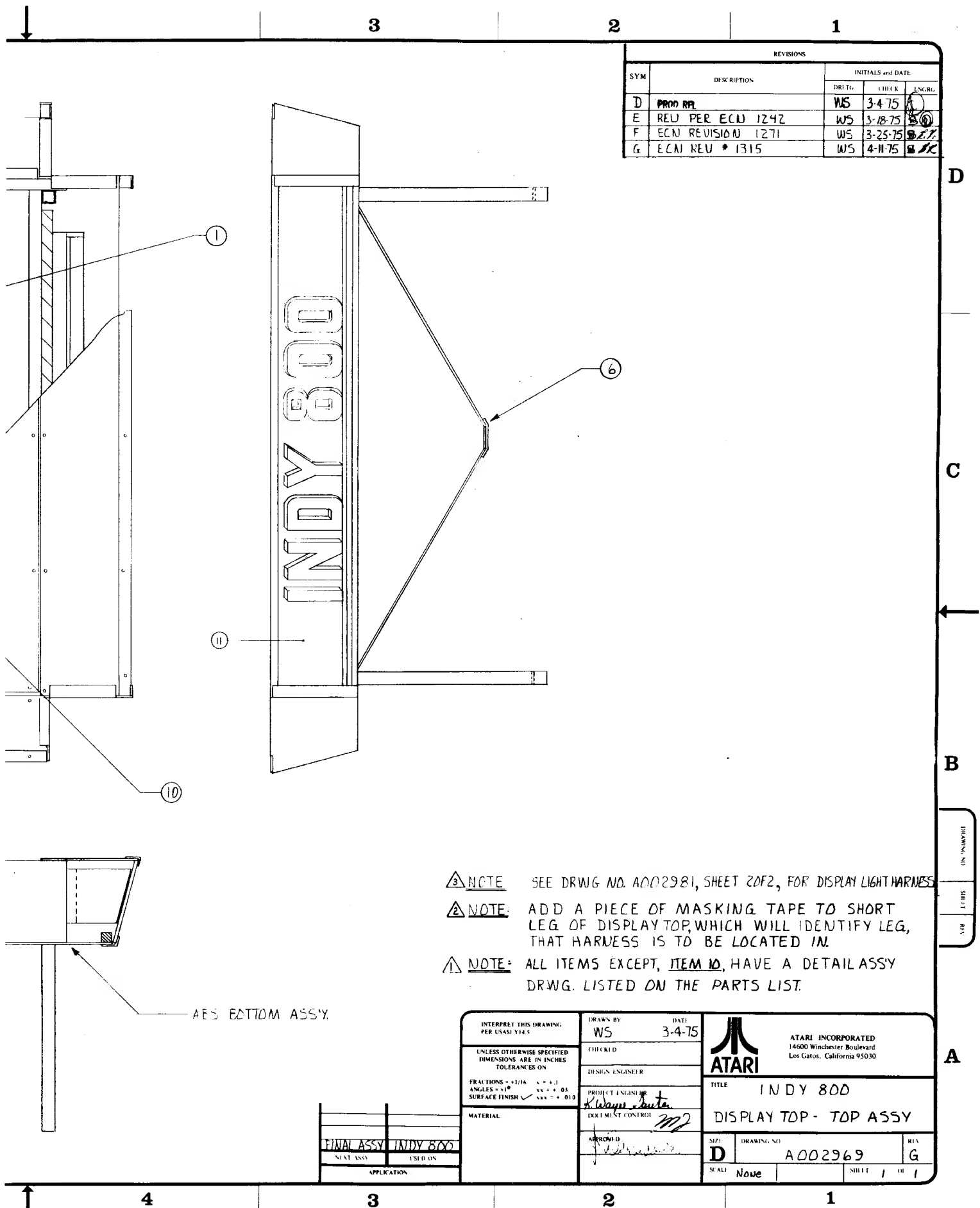
Item	Part Number	Qty.	DESCRIPTION
1	A002929	REF	Display Top - Cabinet Assy
2	A002978-01	2	Top Plex Retainer Assy-Small
3	A002978-02	2	Top Plex Retainer Assy- Large
4	A002981	4	Fluorescent Light Assy
5	A003389-01	2	Bottom Plex Retainer Assy-Small
6	A002979	1	Mirror Plex & ABS Retainer Assy
7	A003305-04	1	Display Top, Sub-Harness
8	A002982	1	Alum. Corner Cap & Shorting Leg Assy
9	A003389-02	2	Bottom Plex Tetainer Assy-Large
10	002939	Ref	Display Top - Cover
11	A002930	4	Plexiglas S/S Layout



TOP VIEW



SIDE VIEW



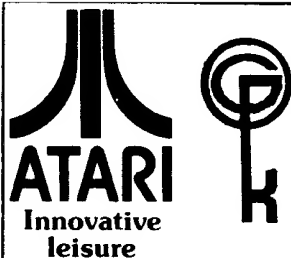
REVISIONS				
SYM	DESCRIPTION	INITIALS AND DATE		
		DRG. T.	CHECK	ENGR.
D	PROD RPL	WS	3-4-75	A
E	REV PER ECN 1242	WS	3-18-75	B
F	ECN REVISION 1271	WS	3-25-75	C
G	ECN REV # 1315	WS	4-11-75	D

- △ NOTE SEE DRWG NO. A002981, SHEET 20F2, FOR DISPLAY LIGHT HARNESS
- △ NOTE ADD A PIECE OF MASKING TAPE TO SHORT LEG OF DISPLAY TOP, WHICH WILL IDENTIFY LEG, THAT HARNESS IS TO BE LOCATED IN.
- △ NOTE ALL ITEMS EXCEPT, ITEM 10, HAVE A DETAIL ASS'Y DRWG. LISTED ON THE PARTS LIST.

INTERPRET THIS DRAWING: PER USASI Y14.5		DRAWN BY WS		DATE 3-4-75	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON		CHECKED		ATARI	
FRACTIONS = 1/16 x = +.1 ANGLES = 1/8" y = +.03 SURFACE FINISH ✓ z = +.010		DESIGN ENGINEER		TITLE INDY 800	
MATERIAL		PROJECT ENGINEER K. Wayne Smith		DISPLAY TOP - TOP ASSY	
APPLICATION		DOCT MIST CONTROL m2		REV G	
FINAL ASSY INDY 800		APPROVED		SIZE D	
NEXT ASSY		DRAWING NO. A002969		SCALE None	
USED ON		SHEET 1		OF 1	

DRAWING NO.
SHEET
REV

A



ASSEMBLY TITLE / INDI 000 - BASE CABINET FOR ASSI P/L 002967

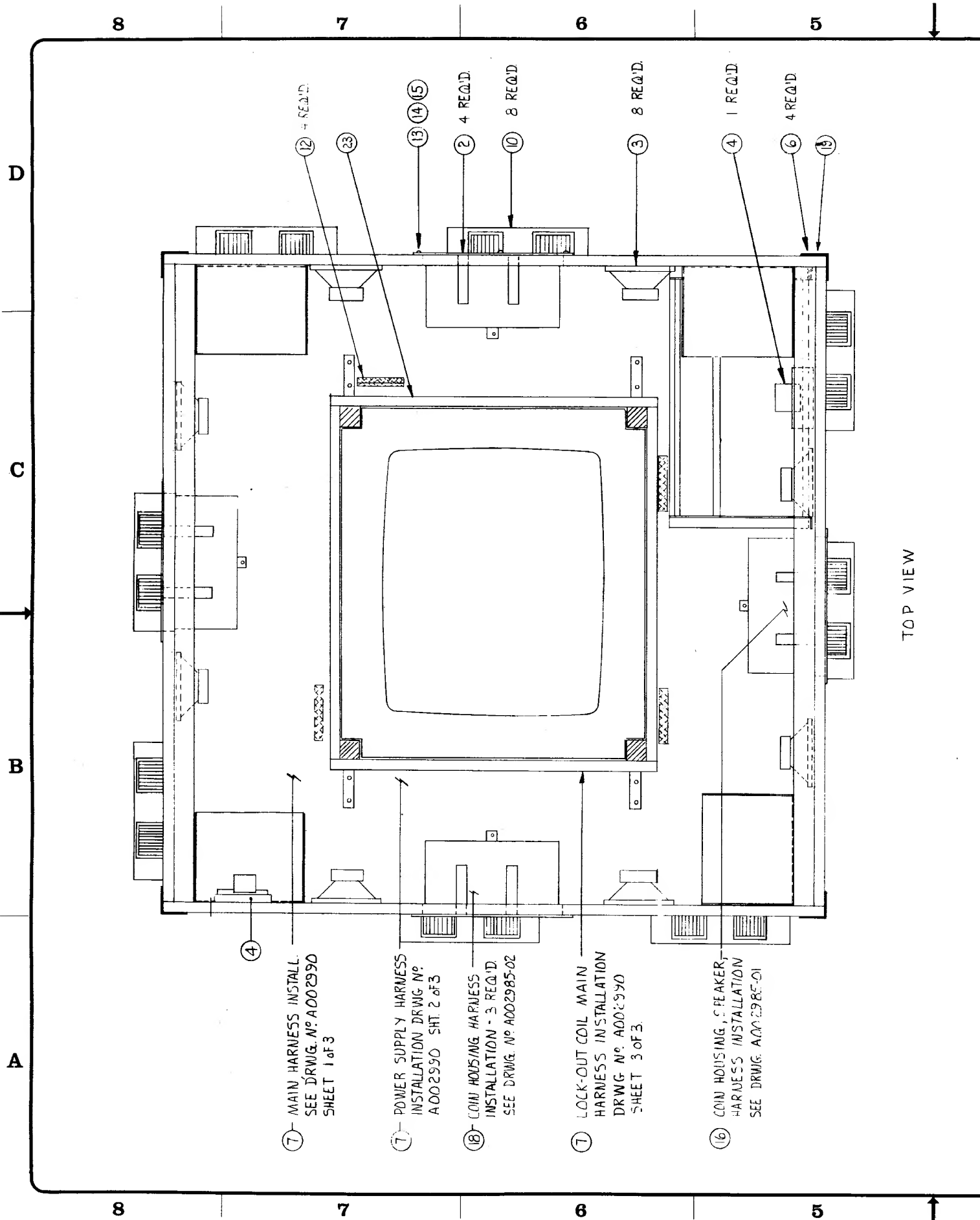
PARTS LIST SPECIFICATION

Page 1 of 1

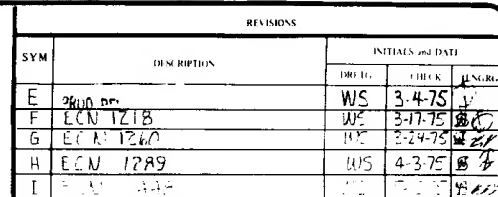
Drawn			
Checked		Mech. Eng.	
Proj. Eng.	Wayne Hunter	Elec. Eng	
			REV. I

Rev.	Description	Date	Apprv.	Rev.	Description	Date	Apprv.
A		2/3/75		H	Rev per ECN 1289	4-3-75	
B	Rev per ECN 1112	2/6/75		I	Rev per ECN 1448	5/22/75	
C	Rev per ECN 1121	2/11/75					
D	" " " 1122	2-14-75					
E	" " " 1153	2/26/75					
F	" " " 1218	3/17/75					
G	" " " 1260	3/24/75					



Item	Part Number	Qty.	DESCRIPTION
1	A002913	REF	Base Cabinet Assy
2	A003332	4	Coin Door Assy
3	A002960	8	Speaker Assy
4	A003427	2	Cooling Fan Assy
5	003486	4	ABS. Water Protective Shield
6	002958	4	Corner Protective Brackets
7	A002990	1	Main Harness, Installation Assy
8			
9	A002955	1	PCB Rack Assy
10	A002947	8	Foot Pedal Mounting Assy
11	003826-01	1	Dust Filter Foam
12	003826-02	4	Dust Filter Foam
13	75-5120N	24	#10-24 x 1 1/4 Carriage Bolts
14	75-014C	24	#10 Flat Washers
15	75-911S	24	#10 Hex Nuts
16	A002985-01	1	Coin Housing, Speaker, Harness, Installation
17		1	
18	A002985-02	3	Coin Housing Harness Installation
19	73-77003	24	3/16 Dia. Alum. Pop-Rivets (Protective Brkts)
20	72-1516S	16	1/4-20 x 1" Mach. Scr. Pan Hd. Philips
21			
22			
23	A002968	1	T.V. Stand Assy
24	A002991	1	Remote Control Box Assy



TOP VIEW



SERVICE PANEL SIDE
SIDE VIEW

INTERPRET THIS DRAWING PER USAS 9145		DRAWN BY W.S		DATE 3-4-75		 ATARI INCORPORATED 14600 Winchester Boulevard Los Gatos, California 95030	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON		CHECKED		TITLE INDY 800 BASE CABINET-TOP ASSY			
FRACTIONS - 1/16 1/8 1/4 ANGLES - 90° 45° 30° SURFACE FINISH ✓ 3A 2 10		DESIGN ENGINEER					
MATERIAL		PROJECT ENGINEER <i>K. W. Sauter</i> DOCUMENT CONTROL <i>MP</i>					
APPROVED				SIZE D		DRAWING NO A002967	
				SCALE None		SHEET 1 OF 1	
						REV I	



ASSEMBLY TITLE / INDY 800 CARD RACK ASSY

P/L 002955

PARTS LIST SPECIFICATION

Page 1 of 1

Drawn

Checked *MJ 2/26/75*

Mech. Eng. *R. Palmer*

Proj. Eng. *Dave Hunter*

Elec. Eng

REV.

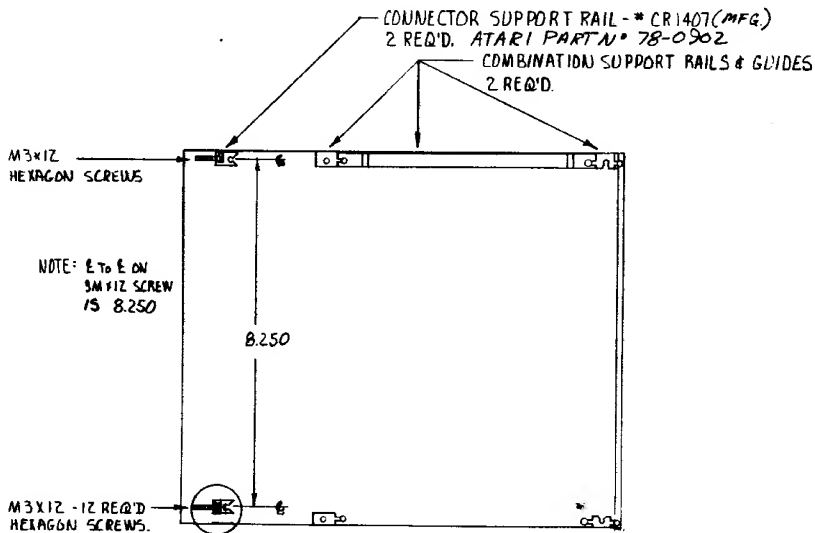
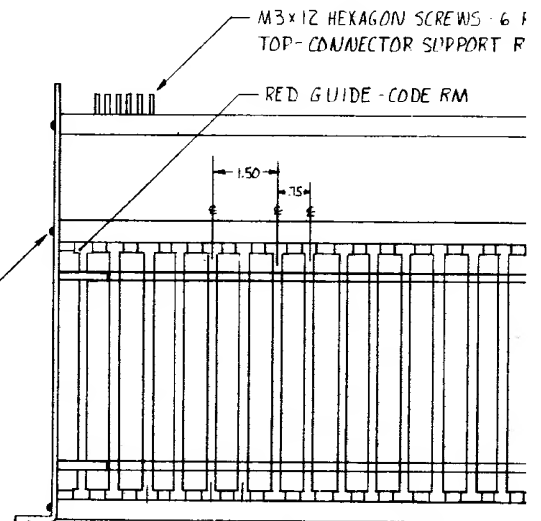
C

Rev.	Description	Date	Apprv.	Rev.	Description	Date	Apprv.
A	PROD REL	2/18/75	<i>AK</i>				
B	Rev per ECN 1277	3/26/75	<i>8</i>				
C	" " " 1313	4/11/75	<i>8</i>				

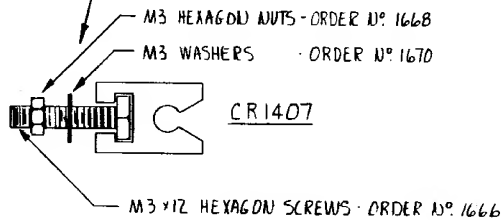
Item	Part Number	Qty.	DESCRIPTION
1	78-0901	1	Card Rack Kit CR 2966
2	78-0902	2	Connector Support Rail CR 1407
3	72-6612	4	Self-Tapping Screws, #6 x 3/4 Pan Head Sht. Mtl.
4	002974-01	1	Angle Brkt.
5	002974-02	1	Angle Brkt.
6	A003000	8	Car Board
7	A003184	1	Coin Control Board
8	A003170	1	Score Board
9	A003182	1	Sync Board
10	A003199	1	Back Plane P.C. Board
11	003517	4	Back Plane Board - Support Bar
12	003518	4	Fish. Paper, Insulator
13			

MFR PART N°	DESCRIPTION	QTY.
CR2966	CARD RACK KIT:	
	INCLUDES:	
	1. COMBO SUPPORT RAILS & GUIDES	2
	2. END PLATES	2
	3. 6x1/2 SCREWS	8
	4. M3 SCREWS, HEX	A/R
	5. M3 NUTS	A/R
	6. M3 WASHERS	A/R
CR1407	CONNECTOR SUPP. RAIL	2

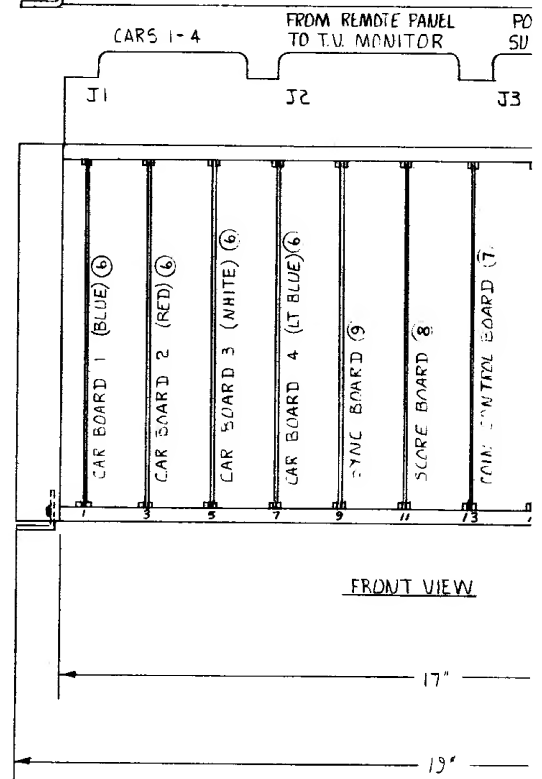
SCREWS, 1/2 x 6, #1416
TO BE PROVIDED - QTY. 8



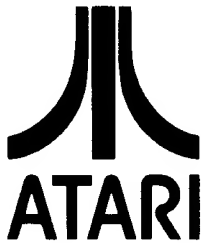
END VIEW



NOTE: NUTS & WASHERS TO BE PROVIDED WITH M3x12 HEX. SCR.



FRONT VIEW



JOB TITLE RACETRAK STEERING PCB ASSY

Dwg. P/L 000607

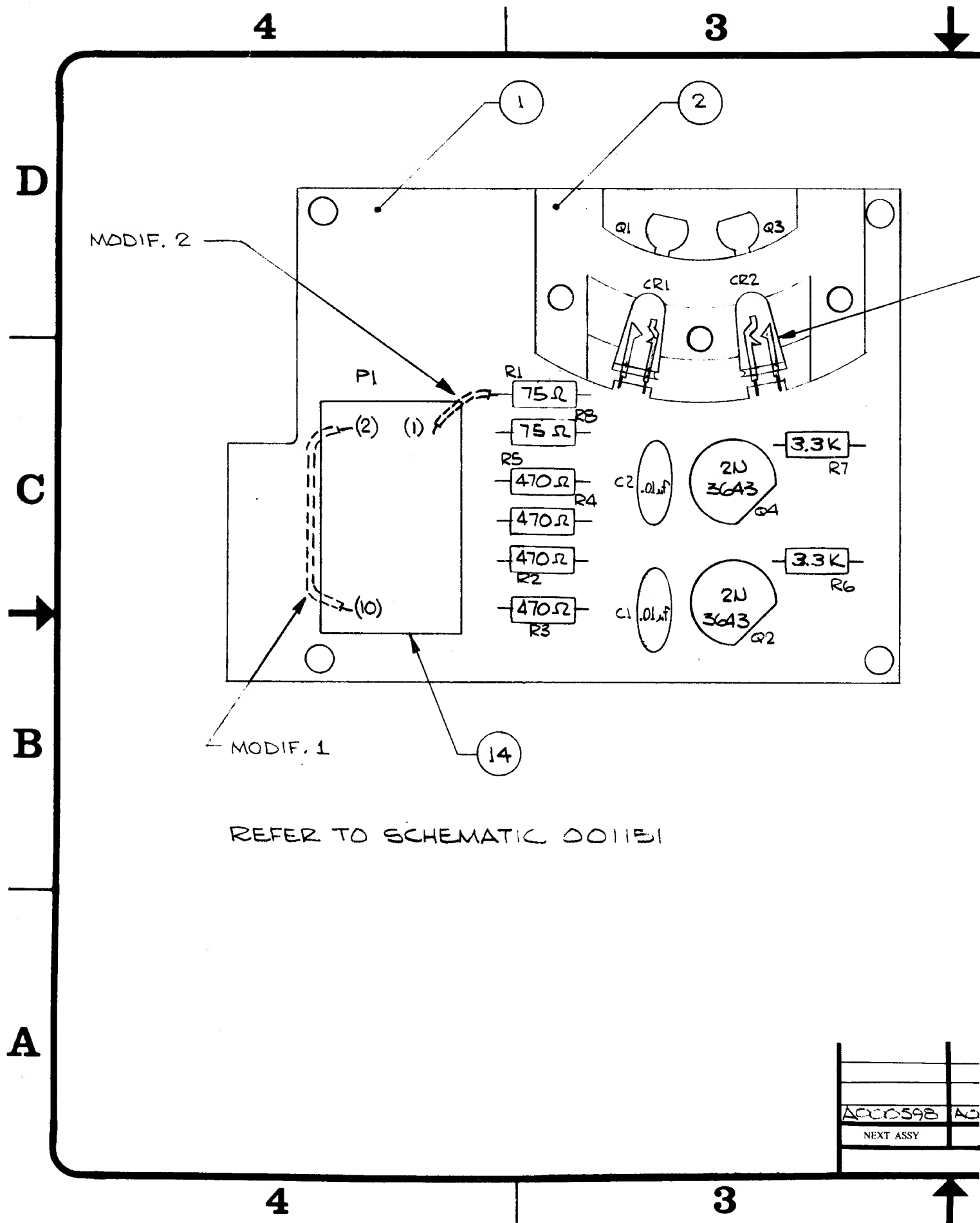
Parts List Specification

sheet 1 of 1

Drawn		
Checked	Mech. Eng.	Rev.
Proj. Eng.	Elec. Eng.	
		M

Rev.	Description	Apprv.	Rev.	Description	Apprv.
H	Redesigned	5-6-74			
J	Rev per ECN 397	5/28/74			
K	Rev per ECN 457	6/3/74			
L	Rev per ECN 601	7/15/74			
M	Rev per ECN 1531				

Item	Part. No.	Qty.	Description
1	000614	1	Printed Circuit Board (E)
2	001092	1	Light Mount
3	001151	Ref	Schematic Diagram
4	11750/10-5750	2	Resistor, Comp., 75 ohm, $\frac{1}{4}$ watt, 5%
5	11471/10-5471	4	Resistor, Comp, 470 ohm, $\frac{1}{4}$ watt, 5%
6	11332/10-5332	2	Resistor, Comp, 3.3Kohm, $\frac{1}{4}$ watt, 5%
7	34104 /27-101103	2	Capacitor, Ceramic, .01uf
8	70006/38-2N5777	2	Transistor, 2N 5777 (Photo Darlington)
9	70000/34-2N3643	2	Transistor, 2N 3643
10	71008/38-ME7124	2	Light Emitting Diode, I.R. ME 7124
11			
12			
13			
14	80089 /79-58005	1	Connector, 10 pin, PC Mount, Amp #1-380991
15	72-1212S	1	Screw, Machine, Pan Head Phil, #2-56 x 3/4 Lg.
16	75-042	1	Washer, Split Lock #2
17	75-912S	1	Nut, Hex, #2-56
18	003749	1	Retainer, Led Light Mount



↓ 2
1

REVISIONS				
SYM	DESCRIPTION	INITIALS and DATE		
		DRFTG	CHECK	ENGRG
H	REDESIGNED	5-3-74	<i>[Signature]</i>	<i>[Signature]</i>
J	REV. PER ECN 397	5-28-74	<i>[Signature]</i>	<i>[Signature]</i>
K	REV. PER ECN 457	6-3-74	<i>[Signature]</i>	<i>[Signature]</i>
L	REV PER ECN 601	7-16-74	<i>[Signature]</i>	<i>[Signature]</i>
M	REV PER ECN 1531	7/8/75	<i>[Signature]</i>	<i>[Signature]</i>

⊖ 10 2 PLACES

MODIFICATIONS: FOR 000614 REV J P.C. BOARDS

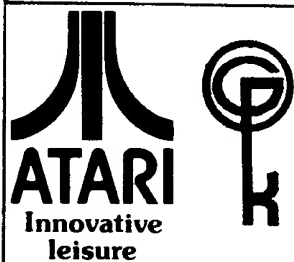
1. JUMPER FROM PIN 2 TO PIN 10 OF THE 10 PIN CONNECTOR, ON CIRCUIT SIDE OF BOARD.
2. JUMPER FROM PIN 1 OF THE 10 PIN CONNECTOR TO THE PAD MARKED +5V (END OF R1) ON CIRCUIT SIDE OF BOARD.

MODIFICATIONS: FOR 000614 REV K P.C. BOARDS.

1. JUMPER FROM PIN 2 TO PIN 10 OF THE 10 PIN CONNECTOR, ON CIRCUIT SIDE OF BOARD.

INTERPRET THIS DRAWING PER USASI Y14.5 UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON: FRACTIONS = $\pm 1/16$.x = $\pm .1$ ANGLES = $\pm 1^\circ$.xx = $\pm .03$ SURFACE FINISH \checkmark .xxx = $\pm .010$ MATERIAL: SEE PL 000607	DRAWN BY	DATE	 ATARI INCORPORATED 14600 Winchester Boulevard Los Gatos, California 95030	TITLE ASSEMBLY STEERING BOARD	
	CHECKED	S-6-74			
	DESIGN ENGINEER				
	PROJECT ENGINEER				
	DOCUMENT CONTROL	<i>[Signature]</i>			
	APPROVED	<i>[Signature]</i> 5/21/74			
			SIZE B	DRAWING NO A0000607	REV M
			SCALE 2:1	SHEET 1 OF 1	

38 A000519
USED ON
APPLICATION



ASSEMBLY TITLE / INDY 800 STEERING WHEEL ASSY

P/L 000598-02

PARTS LIST SPECIFICATION

Page 1 of 1

Drawn		
Checked	Mech. Eng.	<i>[Signature]</i>
Proj. Eng.	Elec. Eng.	<i>[Signature]</i>
	RFV.	<i>G</i>

Rev.	Description	Date	Apprv.	Rev.	Description	Date	Apprv.
A	PROD. PH	2/6/75	<i>[Signature]</i>				
G	ECN 1131	2/14/75	<i>[Signature]</i>				

Item	Part Number	Qty.	DESCRIPTION
1	000598	Ref	Steering Wheel Assy (3201-3803)
2	002133	1	Cover, Kee Games Insigna
3	000605	1	Housing (3201-3545)
4	000606	1	Shaft (3201-3544)
6	72-7512	3	Screw, Mach, Fill Hd, Phil #4-20 x 3/4 Lg.
7	A000607	1	Printed Circuit Assy
8			
9	75-07002	2	Washer, Fender, 1/4
10			
11	76-042020	1	Bearing, Thompson (20L20-F)
12	76-041010	1	Bearing, Thompson (10L10-F)
13	78-40102	1	Steering, Wheel 10"
14	75-945N	1	Nut, #4-20, Nylon Lock
15	72-9580	1	Screw, Mach, Truss Hd, Slotted #4-20 x 5 Lg.
16	000616	1	Hub Light
17	75-055	1	Washer, 1/4" Int. Tooth, Starlock
18	78-16002	A/R	Silicone Grease, Compound #5
19	73-1208	2	MACH SCR. 256 x 1/2 PAN HD PH.

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3 PLACES

2 PLACES

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16

5 2 PLACES

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11

2 RS 1

4



NOTES:

APPLY LIGHT FILM OF SILICONE
GREASE #5 COMPOUND (OR EQUIV.)
ON AREAS INDICATED. (ITEM 18)



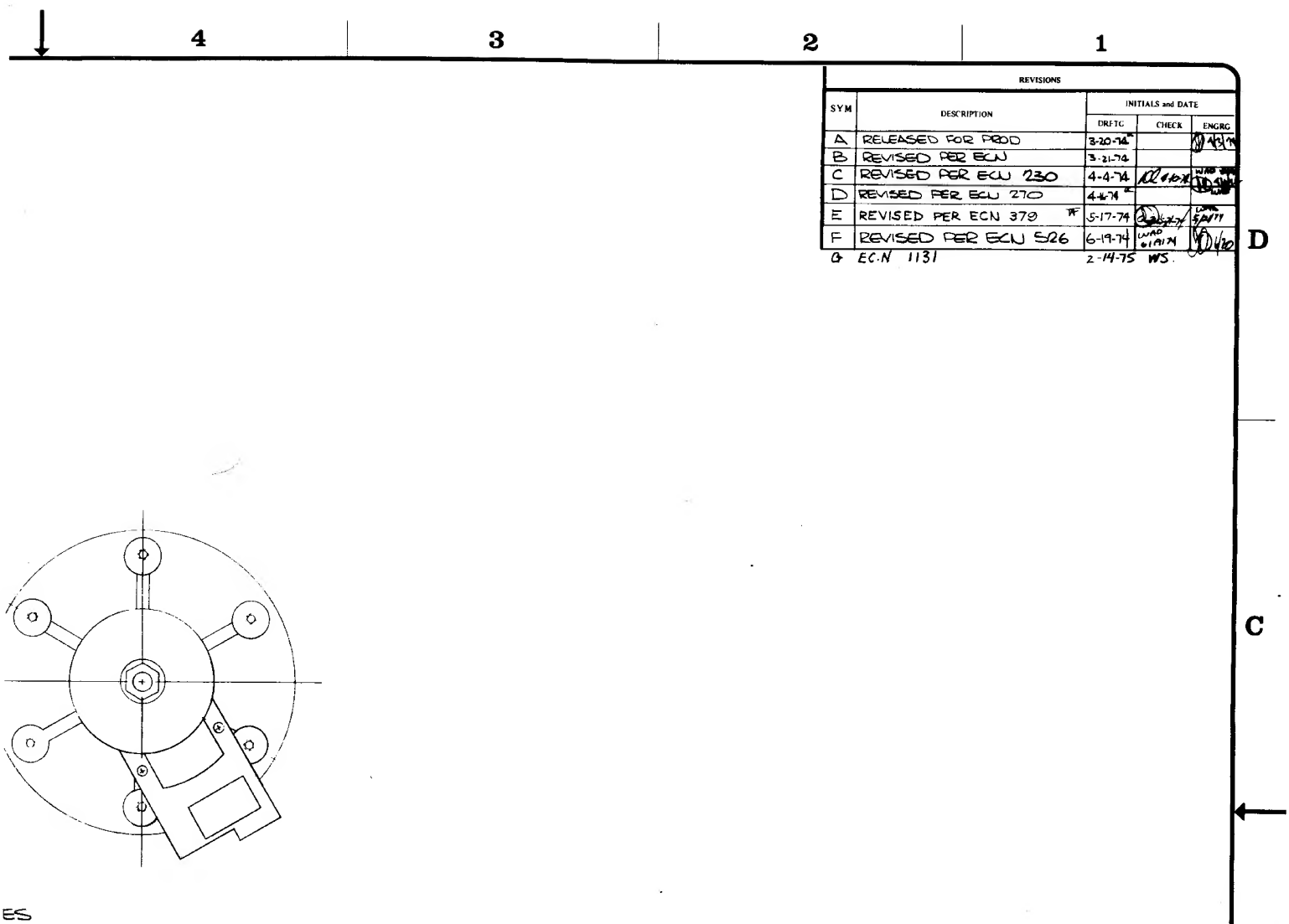
VENDOR PART NO. 3201-3803

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REVISIONS				
SYM	DESCRIPTION	INITIALS and DATE		
		DFTG	CHECK	ENGRG
A	RELEASED FOR PROD	3-20-74		
B	REVISED PER ECN	3-21-74		
C	REVISED PER ECN 230	4-4-74		
D	REVISED PER ECN 270	4-4-74		
E	REVISED PER ECN 370	5-17-74		
F	REVISED PER ECN 526	6-19-74		
G	ECN 1131	2-14-75	WS	

NOTE:

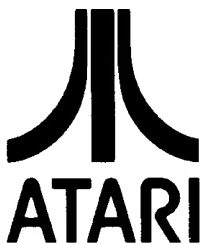
000598-01 - AS SHOWN

000598-02 - OMIT PART N° 78-40101 ADD 78-40102

OMIT " " 000599 ADD 002133

A002947	INDY 800
A000523	A000519
SIXT ASSY	USED ON
APPLICATION	

INTERPRET THIS DRAWING PER USAS Y14.5		DRAWN BY L.C.		DATE 11-19-73	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON:		CHECKED Dale		4-10-74	
FRACTIONS - 1/16		DESIGN ENGINEER		PROJECT ENGINEER	
ANGLES - 1°		DOCUMENT CONTROL		APPROVED	
SURFACE FINISH		MATERIAL SEE A-000598		SCALE	
ATARI INCORPORATED 14600 Winchester Boulevard Los Gatos, California 95030		TITLE ASSEMBLY, STEERING WHEEL		DRAWING NO A000598-XX	
SHEET 1 OF 1		REV G		SCALE	



FOOT PEDAL ASSY

Dwg. P/L 000589

Parts List Specification

sheet 1 of 1

Drawn	Patty		
Checked		Mech. Eng.	Rev.
Proj. Eng	(W) 3/20/74	Elec. Eng.	G

Rev.	Description	Apprv.	Rev.	Description	Apprv.
A	Release for Production	(W) 3/20/74			
B	Revise per ECN 1	(W) 8-21-74	G	REV. PER ECN 969	12-3-74
C	Rev per ECN 229	4-4-74			
D	Rev per ECN 382	5-20-74			
E	Rev per ECN 442	5/28/74			
F	Rev per ECN 460	6-6-74			

Item	Part. No.	Qty.	Description
1	A000589	Ref	Foot Pedal Assy (3201-3555)
2	000590	1	Foot Pedal (3201-3533)
3	000591	1	Pedal Foot (3201-3534)
4	000592	1	Spring (3201-3550)
5	000593	1	Bumper (3201-3551)
6	000594	1	Stop Washer (3201-3552)
7			
8	000597	1	Bearing Block (3201-3549)
9			
10			
11	75199/72-1508S	1	Screw, mach., Pan Hd, Phil # $\frac{1}{4}$ -20 x $\frac{1}{2}$ lg
12			
13			
14	75-7002/75409	1	Washer, Fender $\frac{1}{4}$
15			
16			
17	83268	A/R	Silicone Grease Compound #5
18	84012	A/R	Contact Cement

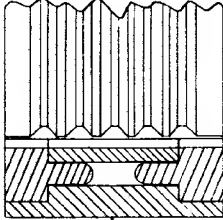
8

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NOTES :

1. TACK ITEM 5 TO ITEM 3 WITH 3M1357 CONTACT ADHESIVE.
2. APPLY LIGHT SMEAR SILICONE GREASE #5 COMPOUND (OR EQUIV.) ON AREAS INDICATED. (ITEM 18)

A

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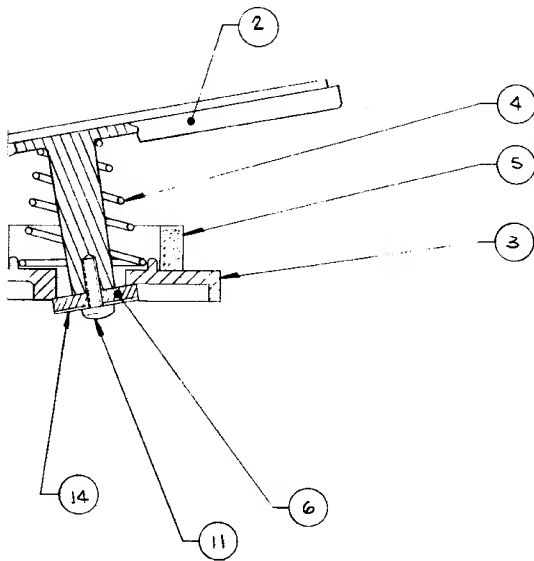
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4 3 2 1

REVISIONS				
SYM	DESCRIPTION	INITIALS and DATE		
		DATE	CHECK	ENGRG
A	RELEASED FOR PROD	3-20-74		
B	PER ECN 194			
C	REVISED PER ECN 229	4-5-74		
D	REVISED PER ECN 382	5-20-74		
E	REVISED PER ECN 442	5-28-74		
F	REVISED PER ECN 460	6-6-74		
G	REVISED PER ECN 969	12-3-74		



D
C
B
A

DRAWING NO
A000589
1
G

ACC 2271	INDY 800
ACC 1022	ACC 0519
NEXT ASSY	USED ON
APPLICATION	

INTERPRET THIS DRAWING PER USASI Y14.5	DRAWN BY J.S.	DATE 11-19-73	 ATARI INCORPORATED 14600 Winchester Boulevard Los Gatos, California 95030	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON: FRACTIONS = ±.10 ANGLES = ±.1° SURFACE FINISH = 125 ± .03	CHECKED D Cook	DESIGN ENGINEER J. S. J. 4/5/74		
MATERIAL SEE P/L A000589	PROJECT ENGINEER J. S. J. 5/26/74	DOCUMENT CONTROL J. S. J. 4/9/74	TITLE ASSEMBLY FOOT PEDAL	
APPROVED J. S. J. 4/9/74			SIZE D	DRAWING NO A000589
			SCALE -	REV G

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ASSEMBLY INSTRUCTIONS

STEP 1. MOUNT CABINET TOP A002970 TO CABINET BASE A002967

NOTE: BLUE CAR LABEL ON CABINET TOP ASSY MUST BE PLACED OVER PC BOARD RACK AREA IN BASE CABINET ASSY

NOTE: SEE DETAIL "B" SHEET 2, FOR MOUNTING ASSY OF CABINET TOP TO BASE.

STEP 2. INSERT FOUR STEEL LEGS INTO BRACKETS ATTACHED TO TOP

NOTE: EACH STEEL LEG HAS DETAIL HOLES THAT MATCH HOLES IN BRACKETS ON CABINET TOP. SEE DETAIL "C".

STEP 3. PLACE DISPLAY TOP ONTO STEEL LEGS MATCHING HOLES ON THE SHORT LEGS WITH THOSE ON THE LONG STEEL LEGS.

NOTE: SHORT STEEL LEG, IDENTIFIED WITH A PIECE OF TAPE MUST BE PLACED ON LONG STEEL LEG DIRECTLY ABOVE POWER SUPPLY BOARD IN CABINET BASE.

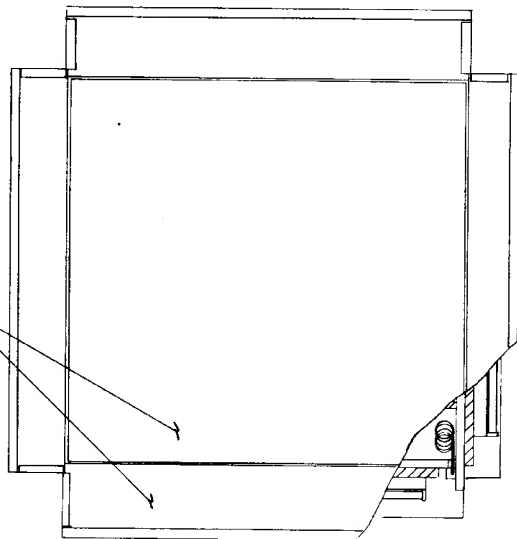
STEP 4. REMOVE COVER AND ONE ABSTOP PANEL FROM DISPLAY TOP ASSY, TO LOCATED DISPLAY TOP HARNESS THAT PASSES THROUGH MARKED STEEL LEG TO CONNECTION IN THE BASE. SEE DETAIL "A". REPLACE COVERS AFTER HARNESS IS CONNECTED.

STEP 5. CAREFULLY LOCATE MOUNTING HARDWARE THROUGH DETAIL HOLES IN LEGS. SEE DETAIL "C" AND "D".

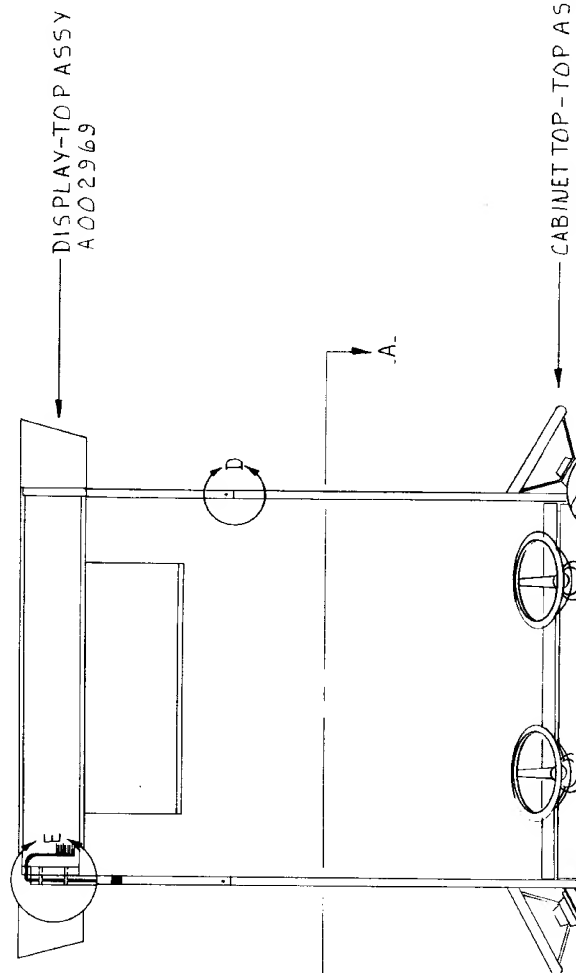
NOTE: MOUNTING HARDWARE, DETAIL "C". REMOVE CONTROL PANEL ASSY FOR EASY ACCESS.

STEP 6. CONNECT ALL HARNESS BY OPENING COIN DOORS FOR EASY ACCESS.

NOTE: REMOVE THESE PANELS IN ASSEMBLY STEP 4.

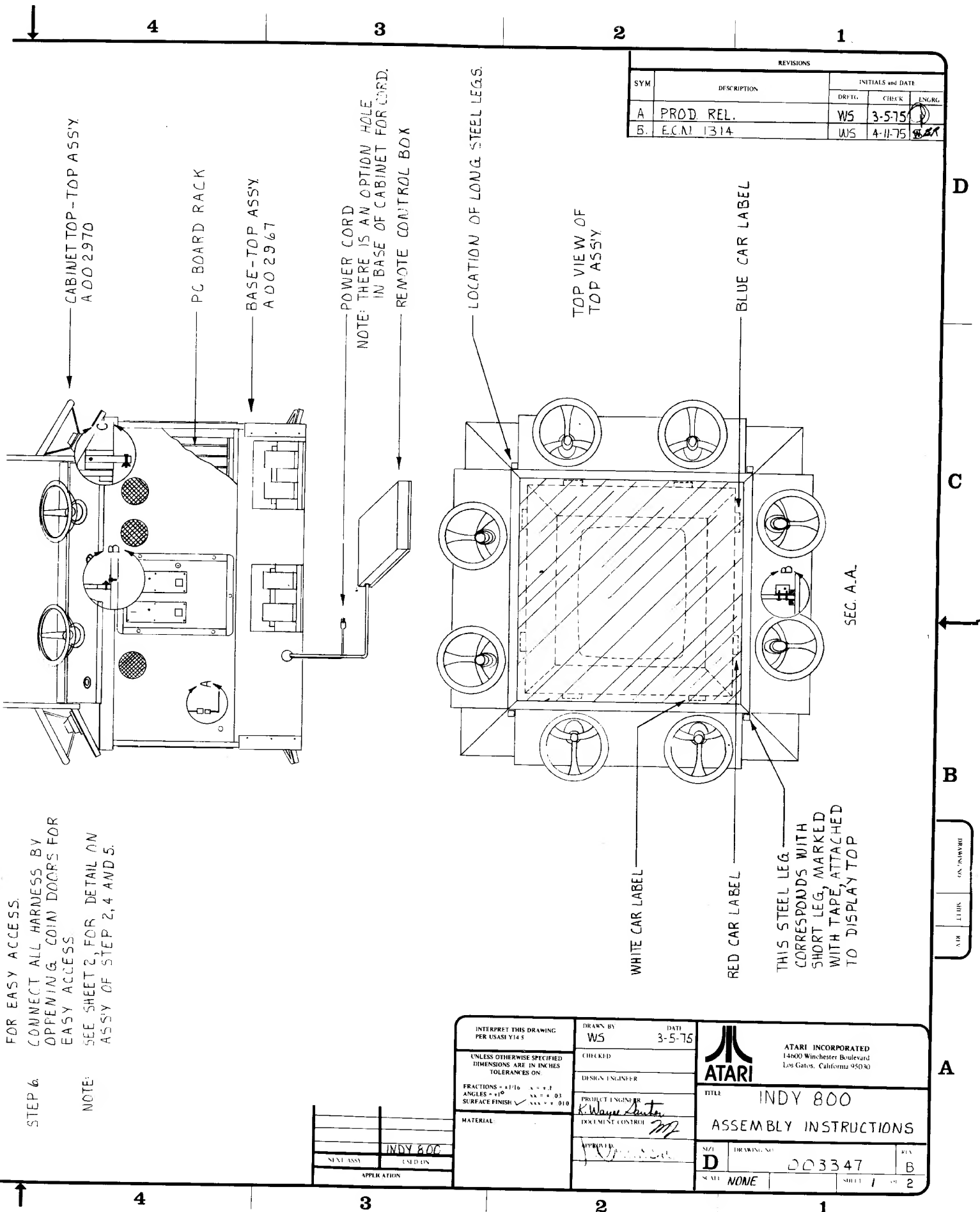


TOP VIEW OF
DISPLAY TOP ASSY



DISPLAY-TOP ASSY
A002969

CABINET TOP-TOP ASSY



8

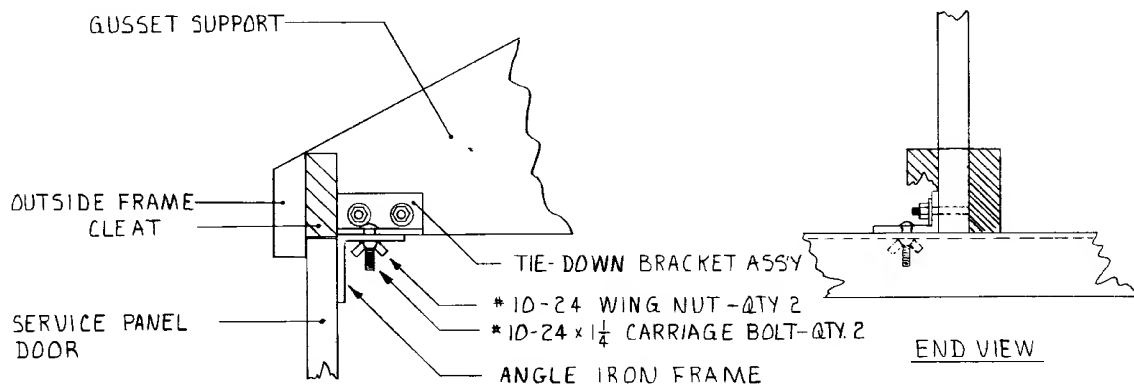
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NOTE:

MFR. P.

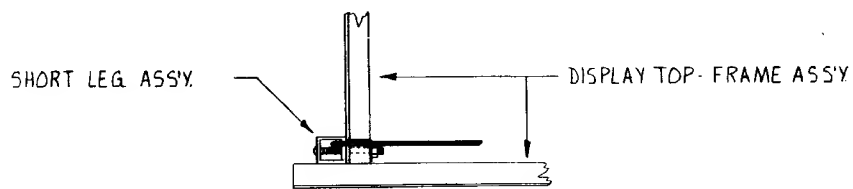


SIDE VIEW

END VIEW

DETAIL B.

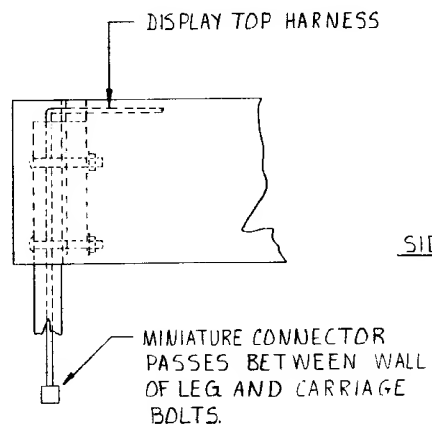
REFER TO STEP 1 OF ASSY INSTRUCTIONS - SHEET 1 of 2.



TOP VIEW

DETAIL E.

REFER TO STEP 4 OF ASSY INSTRUCTIONS - SHEET 1 of 2.



SIDE VIEW

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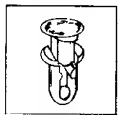
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3

2

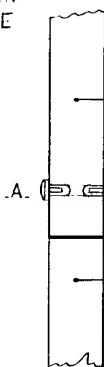
1

NOTE: USE A TUBER WELD IN THE APPLICATION OF THESE FASTENERS.



DETAIL A.

MFR. PART NO. 060184AA-001-805
BLACK



SHORT STEEL LEG FROM
DISPLAY TOP

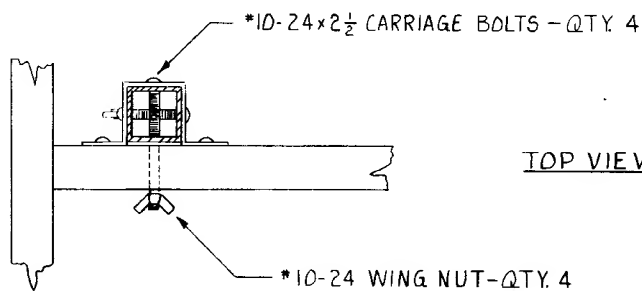
A.

TINNEMAN SPEED
CLINCH FASTENER
QTY. 2/LEG
4 LEGS X 2 = TOTAL 8

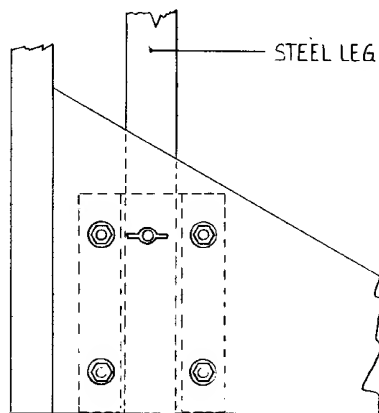
LONG STEEL LEG FROM
CABINET TOP ASSY

DETAIL D.

REFER TO STEP 5 OF ASSY
INSTRUCTIONS - SHEET 1 OF 2



TOP VIEW

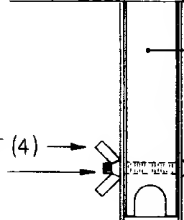


STEEL LEG

DETAIL C.

REFER TO STEP 5 OF ASSY
INSTRUCTIONS - SHEET 1 OF 2.

*10-24 WING NUT (4)
*10-24x1 1/2 (4)
CARRIAGE BOLT



SIDE VIEW

LONG STEEL LEG WITH DETAIL
FOR DISPLAY TOP HARNESS
PASS THROUGH.
SEE NOTE OF STEP 3 ON SHEET
1 OF 2, ASSY INSTRUCTIONS.

REVISIONS				
SYM	DESCRIPTION	INITIALS and DATE		
		DRG. TO.	CHECK	ENGRG.
A	PROD. REL	WS	3-5-75	D
B	F.C.N. 1314	WS	4-11-75	W

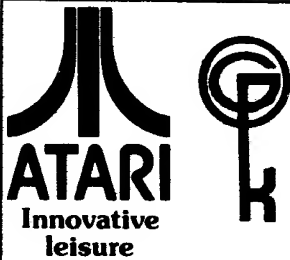
INTERPRET THIS DRAWING PER USASI Y14.5		DRAWN BY WS		DATE 3-5-75	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON:		CHECKED		ATARI INCORPORATED 14600 Winchester Boulevard Los Gatos, California 95030	
FRACTIONS - ±1/16		DESIGN ENGINEER		TITLE INDY 800	
ANGLES - ±1°		PROJECT ENGINEER K. Wayne Sauter		ASSEMBLY INSTRUCTIONS	
SURFACE FINISH - ±.010		DOCUMENT CONTROL		SIZE D	
MATERIAL		APPROVED		DRAWING NO. 003347	
APPLICATION		REV. B		SHEET 2 OF 2	

4

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1



ASSEMBLY TITLE / RT8 BACKPLANE BOARD

P/L 003199

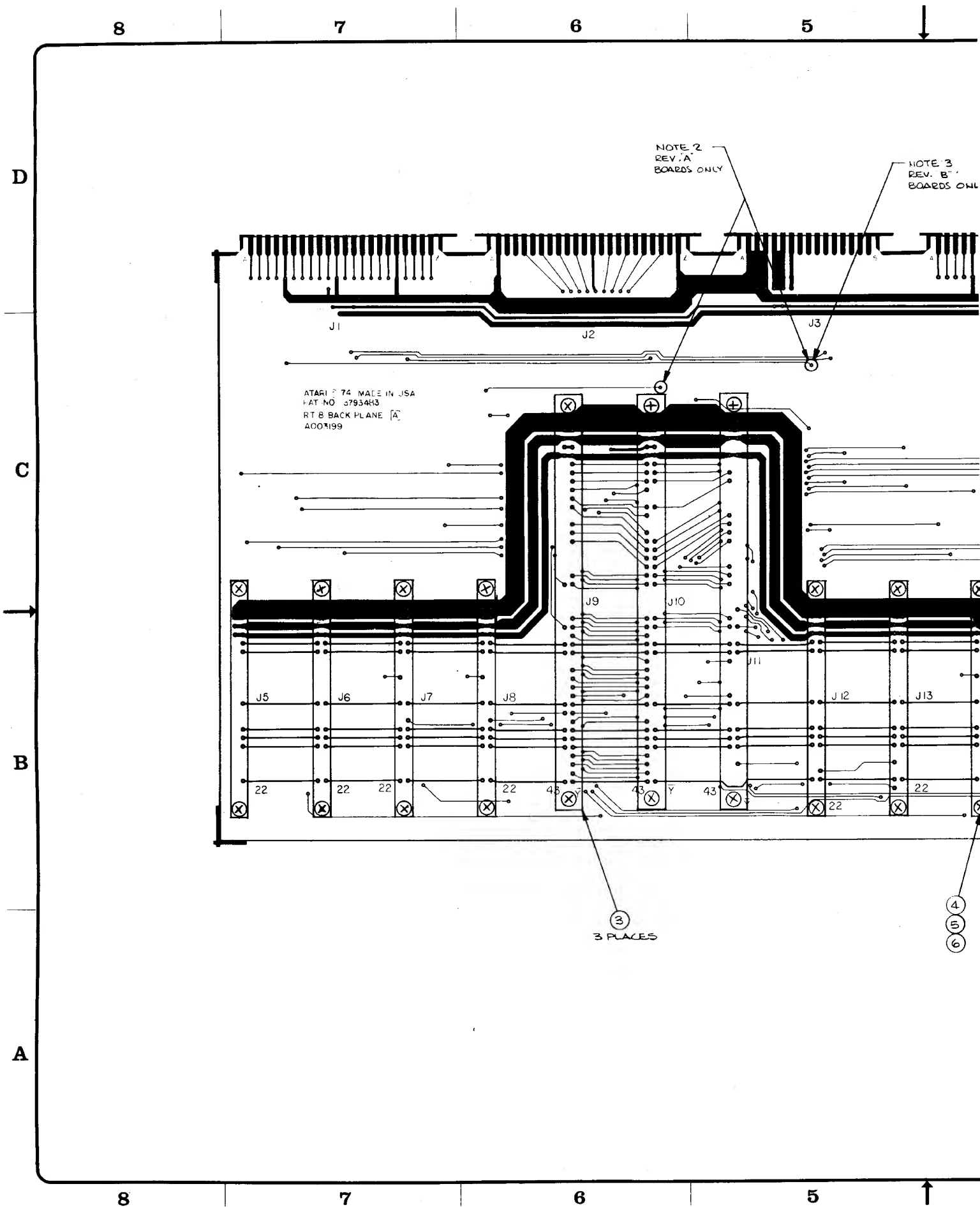
PARTS LIST SPECIFICATION

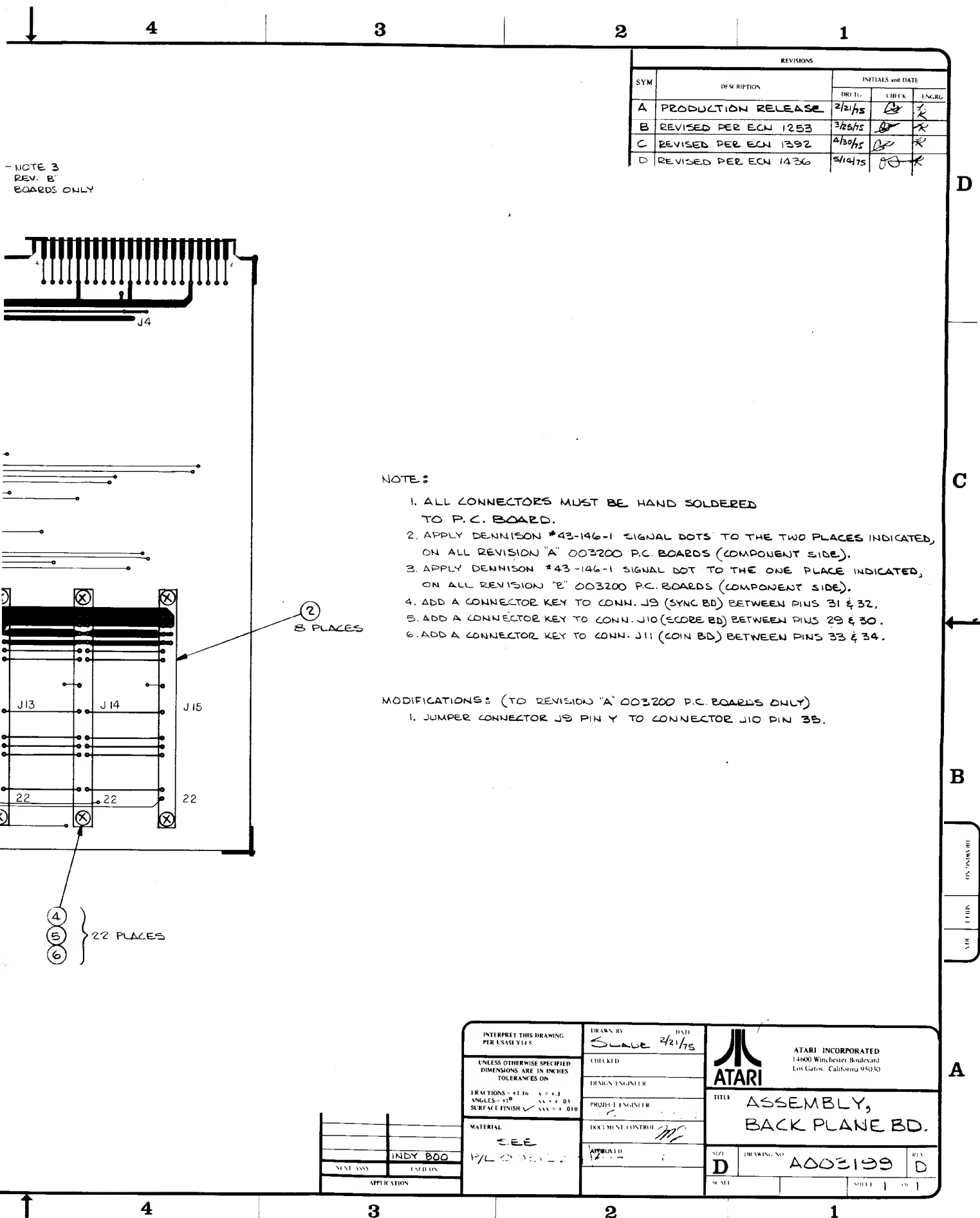
Page 1 of 1

Drawn			
Checked	Mech. Eng.		
Proj. Eng.	Elec. Eng	REV.	

Rev.	Description	Date	Apprv.	Rev.	Description	Date	Apprv.
A		2-3-75					
B	REV PER ECN 1283	3/20/75					
C	REV PER ECN 1392	4/30/75					
D	REV PER ECN 1436	5/14/75					

Item	Part Number	Qty.	DESCRIPTION
1	003200	1	Printed Circuit Board (Backplane)
2	79-514222	8	44 Pin Edge Connector, .156, Dip Solder
3	79-514243	3	86 Pin Edge Connector, .156, Dip Solder
4	75-1408	22	Screw, Mach., Pan Hd., Phil., 4-40 x 1/2"
5	75-914	22	Nut, Machine, Hex, 4-40
6	75-054	22	Lock Washer, Internal Star, #4
7	79-511001	3	CONNECTOR KEY





4

3

2

D

(2) PINS 1 & A TO TOP OF BOARD

OCTO CARD EXTENDER
86 PIN

TOP

C

B

A

COMPONENT SIDE SHOWN

NOTICE TO ALL PERSONS RECEIVING THIS DRAWING
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	RT-B PLAYER
NEXT ASSY	USED ON
APPLICATION	

INTERPRET T
PER USASI YIUNLESS OTHER
DIMENSIONS
TOLERAFRACTIONS = $\pm 1/16$
ANGLES = $\pm 1^\circ$
SURFACE FINISH

MATERIAL:

SE

P/L

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2

1

REVISIONS

SYM	DESCRIPTION	INITIALS and DATE		
		DRFTG	CHECK	ENGRG
A	PRODUCTION RELEASE	2/25/75		

TOP

NOTES

1. SOLDER CONNECTOR (ITEM 2) TO TRACES ON BOTH SIDES OF BOARD.

ENT SIDE SHOWN

D

C

B

DRAWING NO.

SHEET

REV

A

INTERPRET THIS DRAWING
PER USAS Y14.5UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON:FRACTIONS = $\pm 1/16$.X = $\pm .1$
ANGLES = $\pm 1^\circ$.XX = $\pm .03$
SURFACE FINISH \checkmark .XXX = $\pm .010$

MATERIAL:

SEE
P/L003197

DRAWN BY

DATE

CHECKED

DESIGN ENGINEER

PROJECT ENGINEER

DOCUMENT CONTROL

APPROVED

ATARI INCORPORATED
14600 Winchester Boulevard
Los Gatos, California 95030TITLE
ASSEMBLY, RT-8
86 PIN EXTENDERSIZE
C

DRAWING NO.

A003197

REV
A

SCALE

SHEET 1 OF 1

RT-8 PLAYER

NEXT ASSY

USED ON

APPLICATION

2

1

4

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2

D

OCTO CARD EXTENDER
44 PIN

TOP

C

B

COMPONENT SIDE SHOWN

(2) PINS 1 & A TO TOP OF BOARD

A

4

3

2

INTERPRET TO
PER USASI YJ.UNLESS OTHER
DIMENSIONS ARE
TOLERANCEFRACTIONS = ±1/16
ANGLES = 45°
SURFACE FINISH

MATERIAL

SE

P/LC

RT-8 PLAYER

NEXT ASSY

USED ON

APPLICATION

3

2

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REVISIONS

SYM	DESCRIPTION	INITIALS and DATE		
		DRFTG	CHECK	ENGRG
A	PRODUCTION RELEASE	2/25/75	✓	✓

TOP

NOTES:

1. SOLDER CONNECTOR (ITEM 2) TO TRACES ON BOTH SIDES OF BOARD.

JT SIDE SHOWN

D

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B

DRAWING NO.

SHEET

REV

A

INTERPRET THIS DRAWING
PER USASI Y14.5UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON:FRACTIONS $\pm 1/16$.x = $\pm .1$
ANGLES $\pm 1^\circ$.xx = $\pm .03$
SURFACE FINISH ✓ .xxx = $\pm .010$

MATERIAL:

SEE
P/L 003195

DRAWN BY

SLADE 2/25/75

CHECKED

DESIGN ENGINEER

PROJECT ENGINEER

DOCUMENT CONTROL

APPROVED

26 Feb 75

ATARI INCORPORATED
14600 Winchester Boulevard
Los Gatos, California 95030TITLE
ASSEMBLY, RT-8
44 PIN EXTENDERSIZE
C

DRAWING NO

A003195

REV
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SCALE

SHEET 1 OF 1

APPLICATION

2

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ASSEMBLY TITLE / REMOTE CONTROL BOARD

P/L 003193

PARTS LIST SPECIFICATION

Page 1 of 1

Drawn		
Checked	Mech. Eng.	
Proj. Eng.	Elec. Eng	REV. C

Rev.	Description	Date	Apprv.	Rev.	Description	Date	Apprv.
A		2-3-75					
B	Rev per ECN 1148	2-26-75					
C	REV PER ECN 1148	4-2-75					

Item	Part Number	Qty.	DESCRIPTION
1	003194	1	Circuit Board (Remote Control)
2	61-011C	9	SPDT Toggle Switch, PC Mount, w/Panel Dress Nut (C&K #7107 P3 D C B E A7807)
3	62-007	1	SPDT Momentary Pushbutton Switch, PC Mount, w/Cap & Bezel (C&K #8121C 8018-2 w/8025)
4	A003159-01	1	Remote Control Cable
5	78-25001	1	Cable Tie, Screw Down
6	75-247S	1	Screw, Machine, Rd. Hd., Cross Rec #4-40
7	75-054	1	Washer, Lock, Int. Tooth, Steel #4
8	75-914S	1	Nut, Machine, Hex #4-40

4

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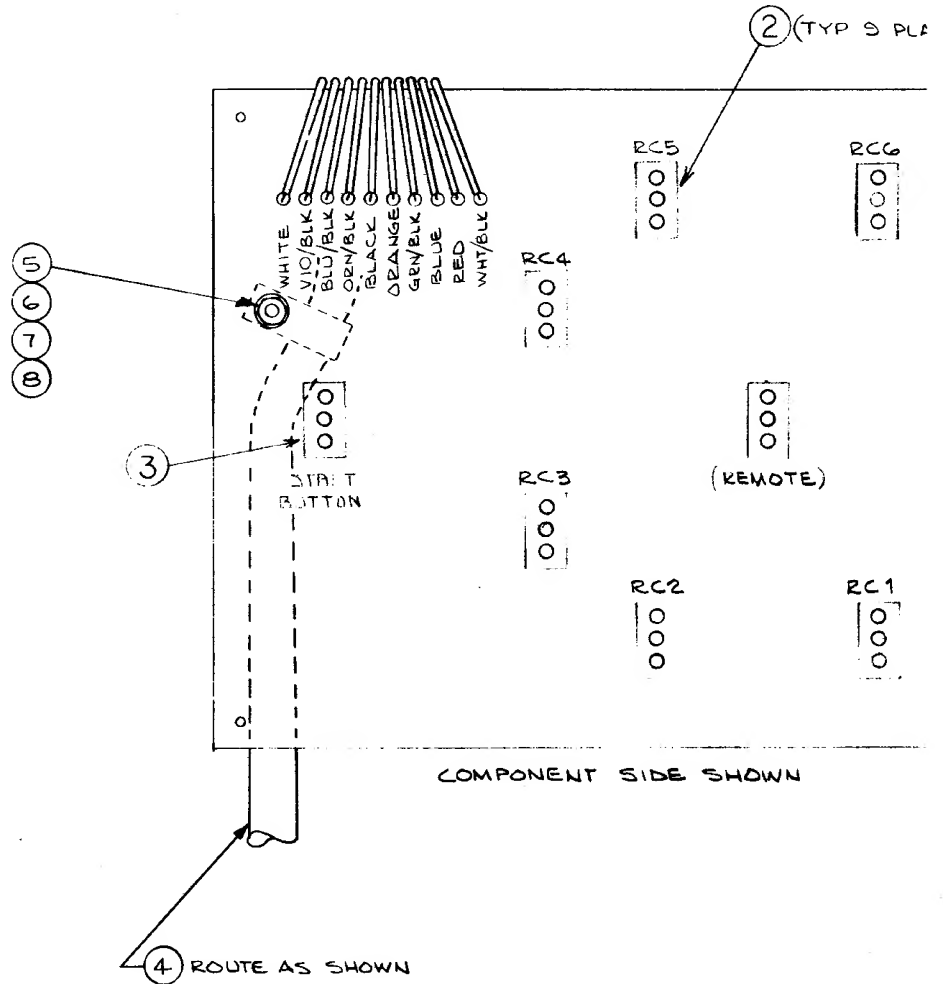
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INTERPRET TI
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FRACTIONS = $\pm 1/1$
ANGLES = $\pm 1^\circ$
SURFACE FINISH

MATERIAL:

SEE

P/L C

APPLICATION	
NEXT ASSY	USED ON
RT-B PLAYER	

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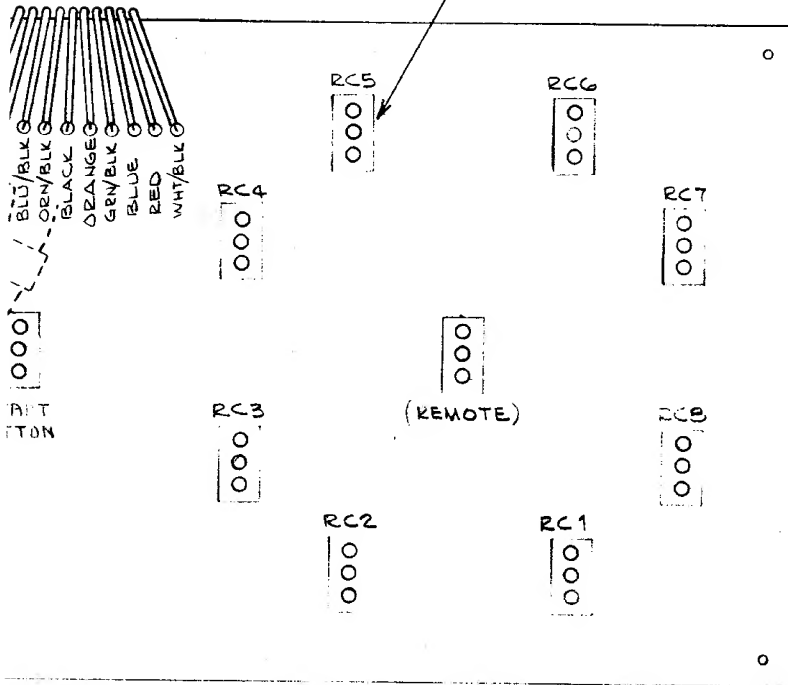
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1

REVISIONS

SYM	DESCRIPTION	INITIALS and DATE		
		DRFTG	CHECK	ENGRG
B	PRODUCTION RELEASE	2/25/75	<i>[initials]</i>	<i>[initials]</i>
C	REVISED PER ECN 1282	4/2/75	<i>[initials]</i>	<i>[initials]</i>

② (TYP 9 PLACES)



COMPONENT SIDE SHOWN

SHOWN

D

C

B

DRAWING NO.
A003193

SHEET
1/1

REV
B

A

INTERPRET THIS DRAWING
PER USASI Y14.5

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON:

FRACTIONS = $\pm 1/16$.X = $\pm .1$
 ANGLES = $\pm 1^\circ$.XX = $\pm .03$
 SURFACE FINISH \checkmark .XXX = $\pm .010$

MATERIAL

SEE
P/L 003193

DRAWN BY

P. BRISTON 2-14-75

DATE

CHECKED

DESIGN ENGINEER

PROJECT ENGINEER

2/1/75 25 FEB 75

DOCUMENT CONTROL

APPROVED

2/2/75



ATARI INCORPORATED
14600 Winchester Boulevard
Los Gatos, California 95030

TITLE

ASSEMBLY, RT-8
REMOTE CONTROL ED

SIZE

C

DRAWING NO.

A003193

REV

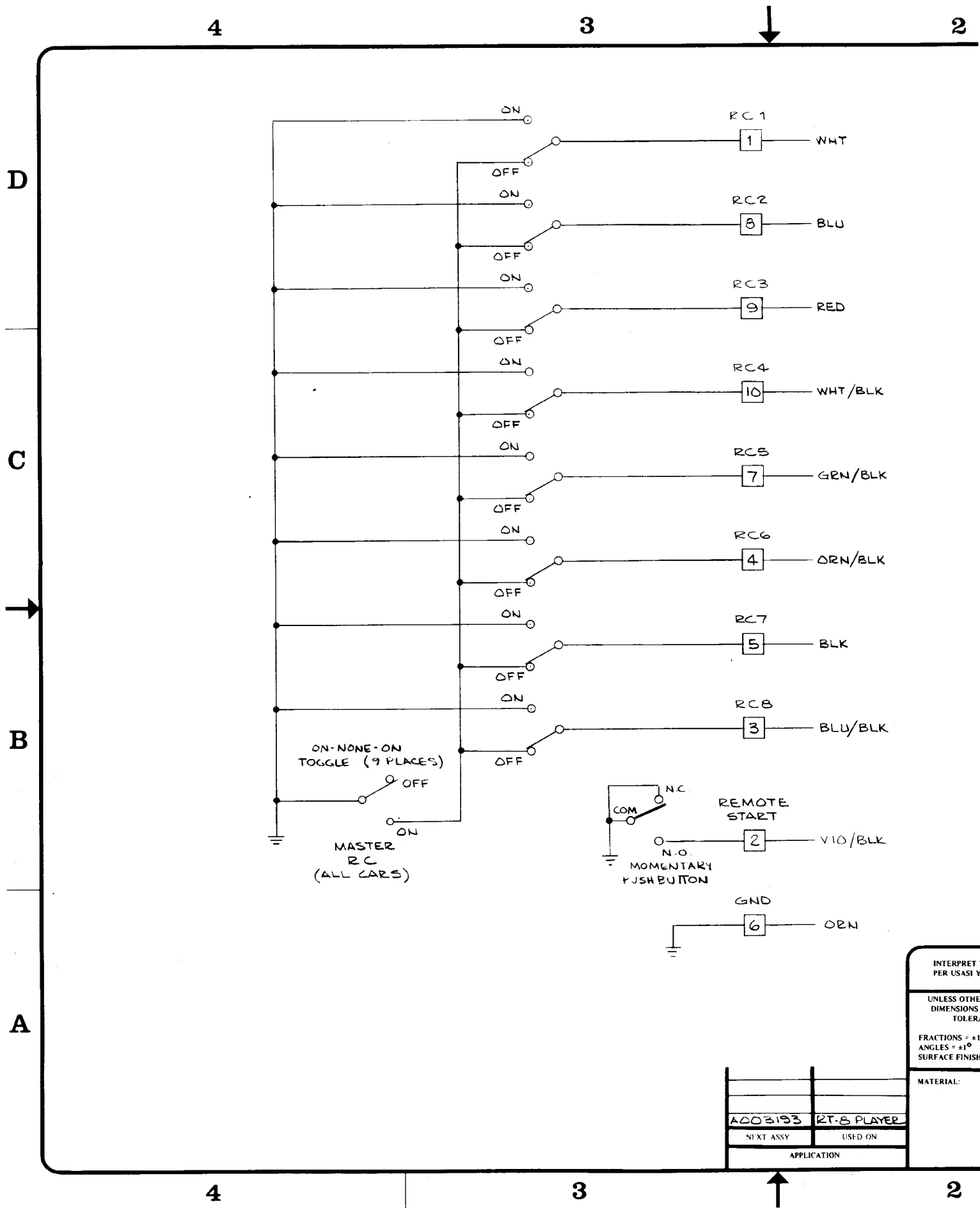
C

SCALE 1:1

SHEET 1 OF 1

2

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INTERPRET
PER USASI Y

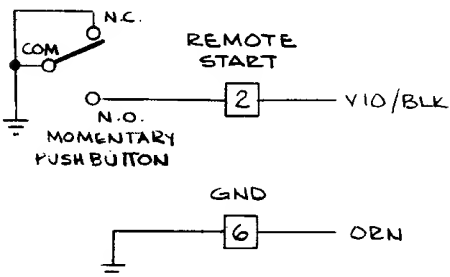
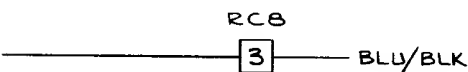
UNLESS OTH
DIMENSIONS
TOLER/

FRACTIONS = +1
ANGLES = ±1°
SURFACE FINISH

MATERIAL:

AD03193	RT-8 PLAYER
NEXT ASSY	USED ON
APPLICATION	

1



REVISIONS				
SYM	DESCRIPTION	INITIALS and DATE		
		DRFTG	CHECK	ENGRG
B	PRODUCTION RELEASE	2/25/75	<i>[Signature]</i>	<i>[Signature]</i>
C	REVISED PER ECN 1282	4/2/75	<i>[Signature]</i>	<i>[Signature]</i>

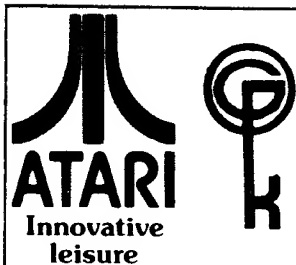
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REVIEW

SHEET 1 OF

APPLICATION

1



ASSEMBLY TITLE / ~~INDY 800~~
POWER SUPPLY P.C.B.

P/L 003191

PARTS LIST SPECIFICATION

Page 1 of 1

Drawn		
Checked	Mech. Eng.	
Proj. Eng.	Elec. Eng	REV. F

Rev.	Description	Date	Apprv.	Rev.	Description	Date	Apprv.
D	REV PER ECN 1290	4/29/75					
E	REV PER ECN 1458	5/30/75					
F	Rev per ECN 1458	5/30/75					

Item	Part Number	Qty.	DESCRIPTION
1	003192	1	P.C.B., Indy 800 Power Supply
2	24-160808	5	Capacitor, Electrolytic, 8000uf, 16V, 85°C
3	24-250508	4	Capacitor, Electrolytic, 5000uf, 25V, 85°C
4	31-MR501	2	Diode, Type MR501 (3A)
5	31-1N1199A	2	Diode, Type 1N1199A (12A)
6	78-06006	1	Heatsink, Wakefield 680-1.25
7	61-011C	1	SPDT Toggle Switch, C & K 7101
8	10-5472	8	Resistor, Carbon, 5%, 1/4W, 4.7K ohm
9	13-0100	8	Resistor, Carbon, 10%, 2W, 10 ohm
10	34-2N3643	8	NPN Transistor, Type 2N3643
11			
12	34-BD437	8	NPN Power Transistor, Type BD 437 (SGS-ATES)
13	72-1405C	12	Machine Screw, 4-40 x 5/16, Stainless
14	75-914S	12	Hex Nut, 4-40
15	75-054	12	Lock Washer, Internal Star, #4
16	75-014S	12	Flat Washer, #4
17	79-58005	3	Connector, 10 pin, P.C. Mount, Amp #1-380991
18	79-3202	4	Fuse Clip, 3AG, Beryllium Copper, Silver Plate, Little Fuse #121001
19	46-2031503	1	Fuse, 3AG, 15A, 32V, Fast-Blow
20	46-203401	1	Fuse, 3AG, 4A, 125V, Fast-Blow
21		8	22 AWG Wire Jumper

D

C

B

A

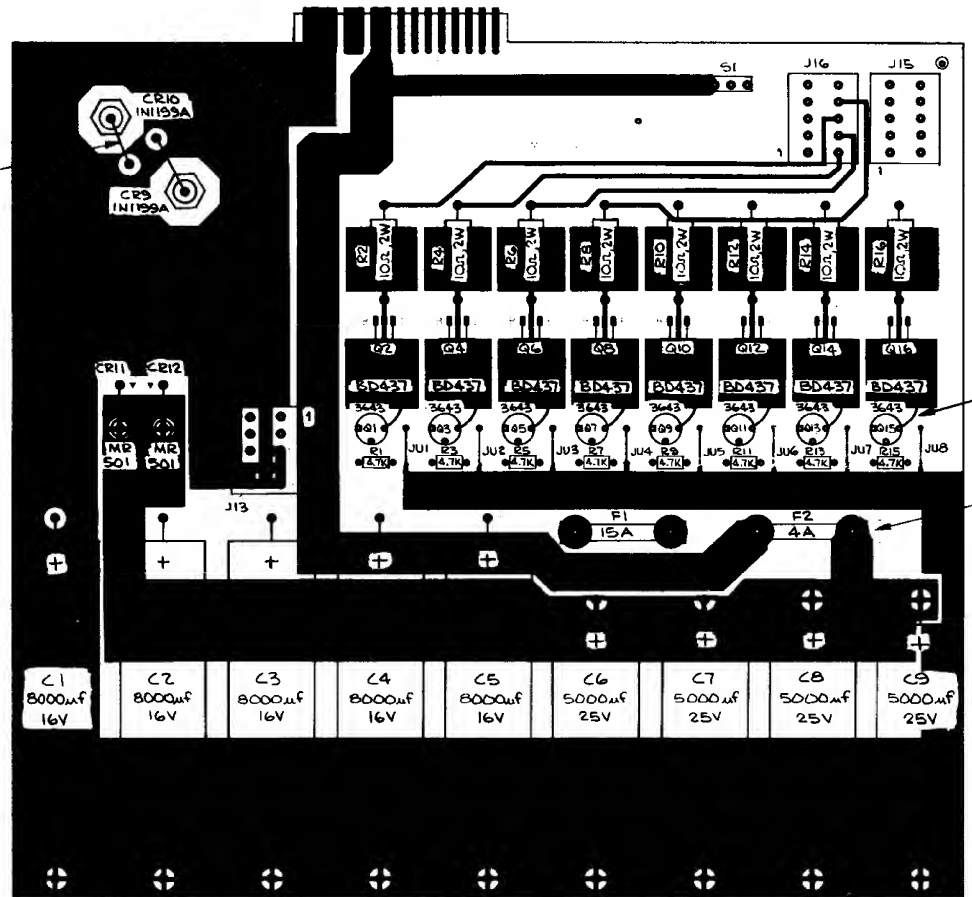
8

7

6

5

#14-AWG WIRE
2 PLACES



4

3

2

1

REVISIONS				
SYM	DESCRIPTION	INITIALS and DATE		
		DRAWN	CHECKED	ENG. REC.
D	REVISED PER ECN 1389	5/12/15	SR	R
E	REVISED PER ECN 1406 & 1424	5/12/15	SR	R
F	REVISED PER ECN 1458, 1466	5/30/15	SR	R

NOTE:

1. MOUNT CR11 AND CR12 (MRS01) VERTICALLY, WITH CATHODE SIDE DOWN.
2. REMOVE PINS 3 AND 8 FROM J13 BEFORE MOUNTING.
3. REMOVE PINS 1 AND 2 FROM J15 BEFORE MOUNTING.
4. REMOVE PINS 9 AND 10 FROM J16 BEFORE MOUNTING.

MOD. 1
8 PLACES

13
14
15
16
18

4 PLACES

MODIFICATIONS: (TO 003192 REVISION "D" BOARDS ONLY)

1. SOLDER THE COLLECTOR LEADS OF THE EIGHT 2N3643 TRANSISTORS TO THE LARGE COPPER AREA AS SHOWN.

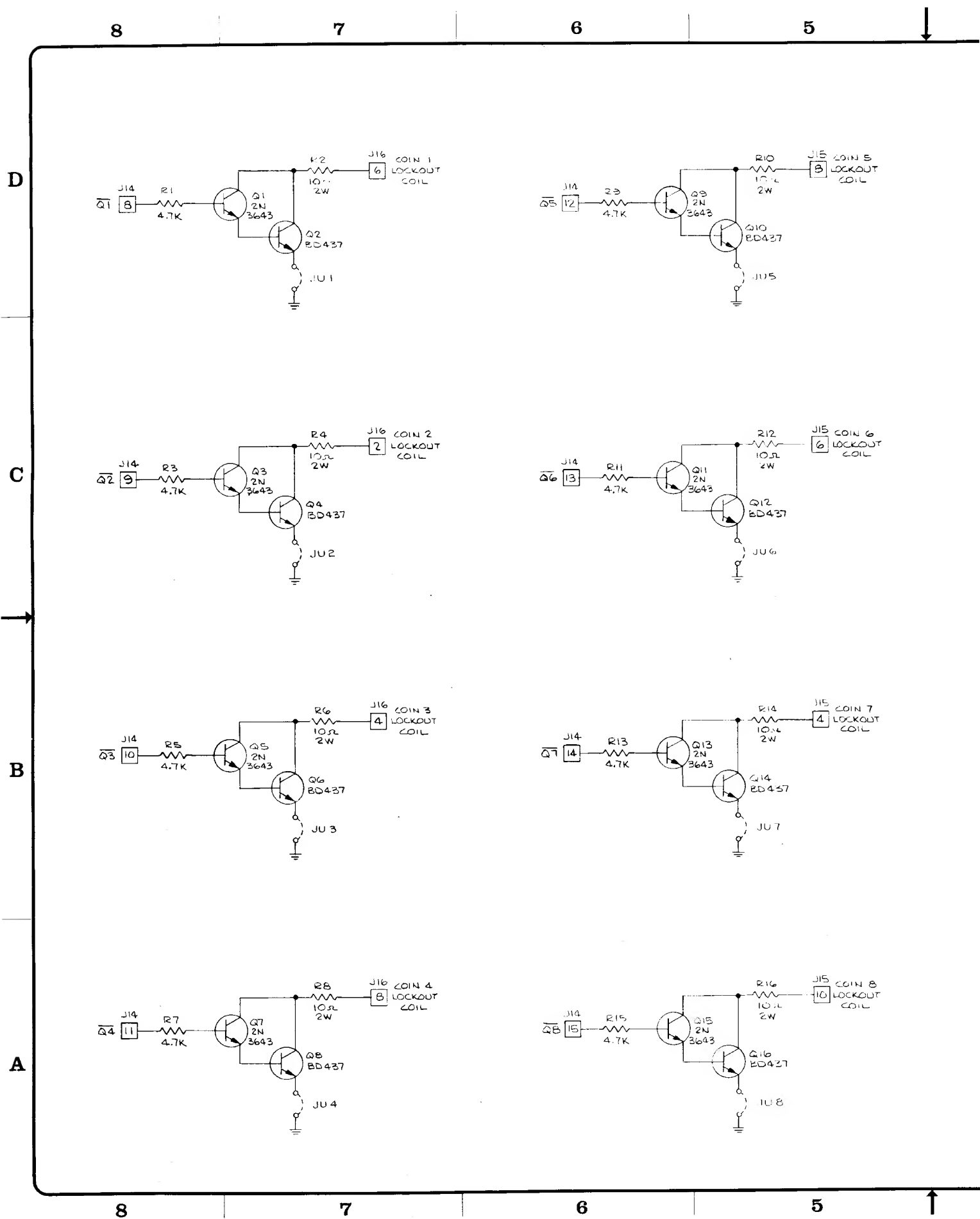
INTERPRET THIS DRAWING PER USASI Y14.5		DRAWN BY SLADE		DATE 9/28/15	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON		CHECKED		ATARI	
FRACTIONS = 1/16 \pm .03		DESIGN ENGINEER		ATARI INCORPORATED 14600 Winchester Boulevard Los Gatos, California 95030	
ANGLES = 45° \pm .03		PROJECT ENGINEER		TITLE ASSEMBLY, POWER SUPPLY BOARD	
SURFACE FINISH \pm .010		DOCUMENT CONTROL		SIZE D	
MATERIAL SEE F/L 003191		APPROVED		DRAWING NO. A003191	
APPLICATION		SCALE 1/1		REV F	

4

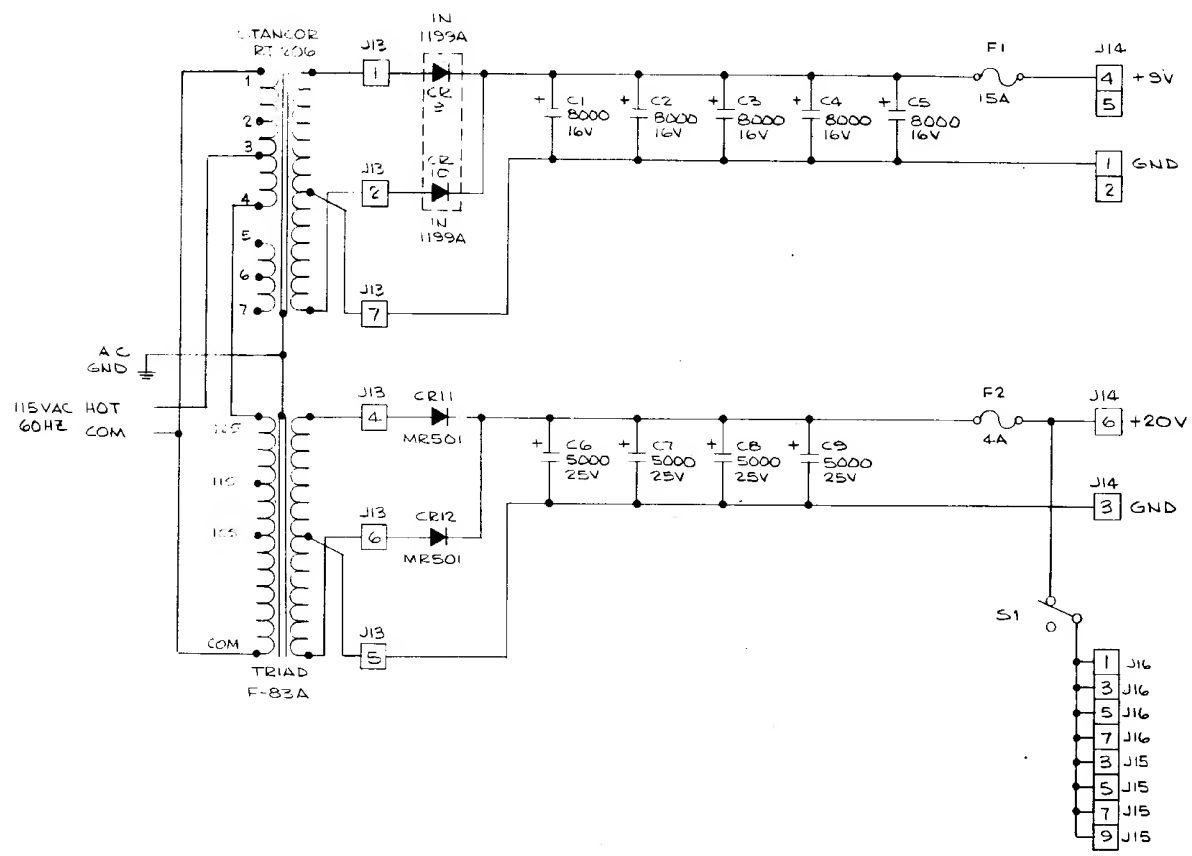
3

2

1



REVISIONS				
SYM	DESCRIPTION	INITIALS and DATE		
		DRG	CHK	ENG
D	REVISED PER ECN 1288	4/28/75	8	K
E	REVISED PER ECN 1406 & 1424	5/17/75	8	K
F	REVISED PER ECN 1453, 1466	5/30/75	8	K



INTERPRET THIS DRAWING PER USASI Y14.5		DRAWN BY: <u>ELADE</u> DATE: <u>4/28/75</u>		 ATARI INCORPORATED 14600 Winchester Boulevard Los Gatos, California 95030
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON:		CHECKED:		
FRACTIONS = 1/16 X = 0.1		DESIGN ENGINEER:		
ANGLES = 45° X X X = 0.1		PROJECT ENGINEER: <u>21 AME</u>		
SURFACE FINISH: X X X = 0.010		DOCUMENT CONTROL: <u>MD</u>		TITLE: SCHEMATIC, POWER SUPPLY BOARD
MATERIAL:		APPROVED: <u>[Signature]</u>		SIZE: D DRAWING NO: 003191 REV: F
A003191 INDY 800 NEXT ASSY USED ON: APPLICATION:				SHEET: <u>1</u> OF: <u>1</u> FILE: <u>003191</u>



ASSEMBLY TITLE / RT8 COIN CONTROL BOARD

P/L 003184

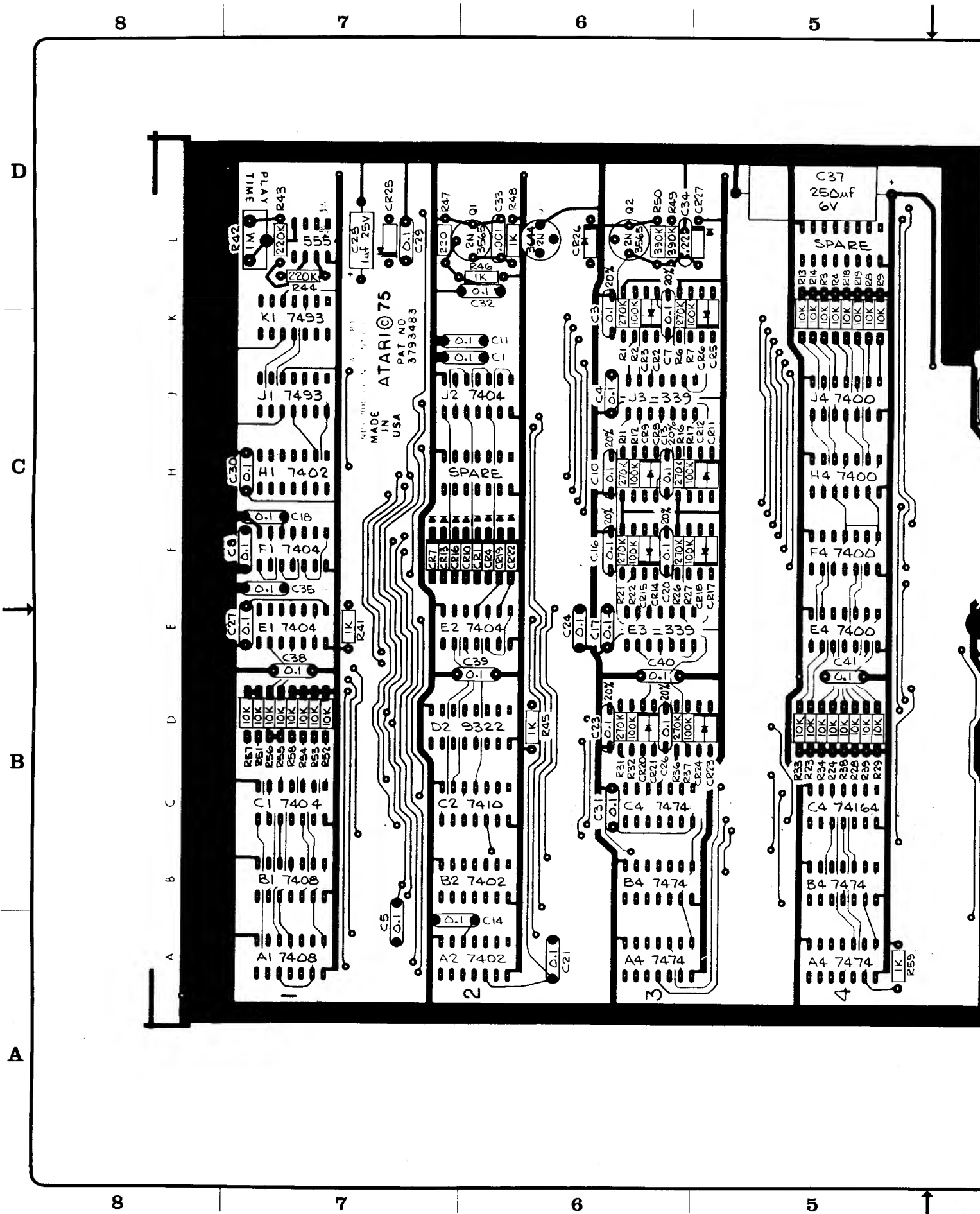
PARTS LIST SPECIFICATION

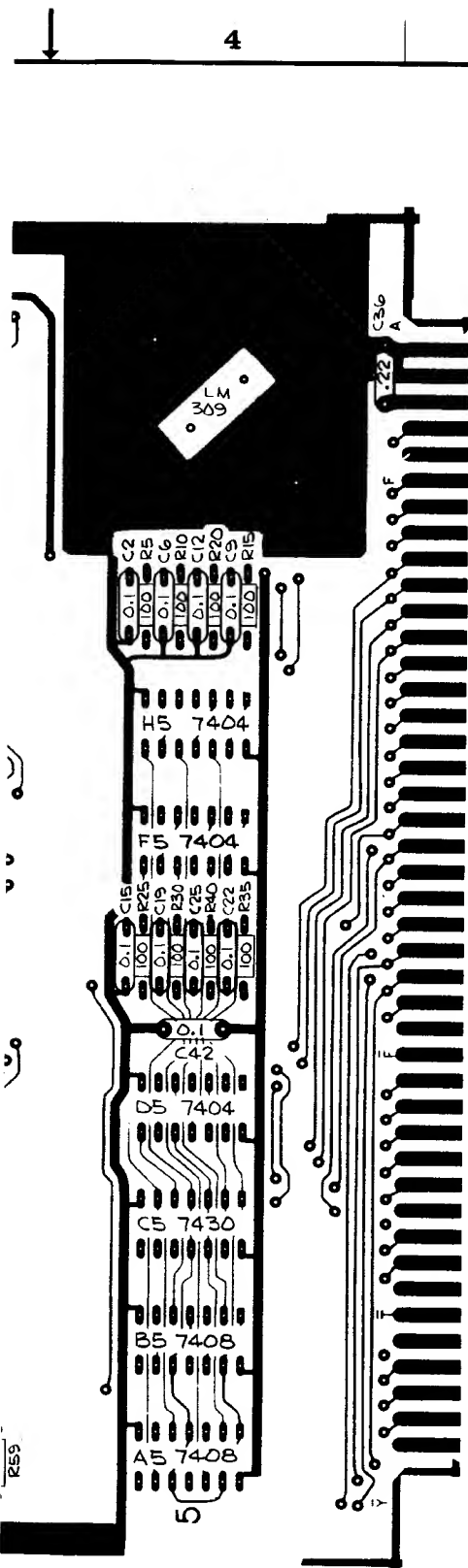
Page 1 of 1

Drawn	
Checked	Mech. Eng.
Proj. Eng.	Elec. Eng.
	REV.

Rev.	Description	Date	Apprv.	Rev.	Description	Date	Apprv.
A		2-4-75					
B	Rev per ECN 1161	2-26-75					
C	REV PER ECN 1287	4-23-75					
D	REV PER ECN 1321/437	5-10-75					
E	REV PER ECN 1321/437	5-10-75					

Item	Part Number	Qty.	DESCRIPTION
1	003185	1	Printed Circuit Board
2	37-LM309	1	LM309K Positive 5-Volt Regulator
3	78-06004	1	Heatsink, WakeField 680-.75A
4	72-1412S	2	Screw, Machine, Pan Hd., Phil., 6-32 x 5/8"
5	75-916S	2	Nut, Machine, Hex, 6-32
6			
7	75-056	2	Lock Washer, Internal Star, #6
8	37-7400	4	7400 I.C.
9	37-7402	3	7402 "
10	37-7404	8	7404 "
11	37-7408	4	7408 "
12	37-7410	1	7410 "
13	37-7430	1	7430 "
14	37-7474	5	7474 "
15	37-7493	2	7493 "
16	37-74164	1	74164 "
17	37-9322	1	9322 "
18	37-555	1	555 Timer I.C.
19	37-LM339	2	LM339 Quad Comparator
20	34-2N3565	2	Transistor, NPN, Type 2N3565
21	31-1N914	27	Diode, Type 1N914
22			
23	10-5101	8	Resistor, Carbon, 5%, 1/4W, 100 ohm
24	10-5102	5	" " " " 1K "
25	10-5103	24	" " " " 10K "
26			
27	10-5104	8	" " " " 100K "
28	10-5224	3	" " " " 220K "
29	10-5221	1	" " " " 220 "
30	10-5274	8	" " " " 270K "
31	19-311105	1	Trimpot, 1M ohm, P.C. Vert. Mount
32	27-101102	1	Capacitor, Ceramic, .001 uf, 100V
33	27-101104	29	" " 0.1 uf, 100V
34	29-011	2	Capacitor, Monolythic, .22 uf, 12V, Rad.
35	24-250105	1	Capacitor Electrolytic, 1 uf, 25V
36	24-060257	1	" " 250 uf, 6V
37	27-120104	8	Capacitor, Ceramic, 0.1 uf, 12V, 20%
38	33-2N3644	1	Transistor, PNP, 2N3644
39	10-5394	2	Resistor, Carbon, 5%, 1/4W, 390K ohm

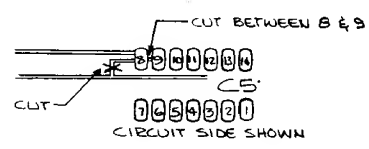




REVISIONS				
SYM	DESCRIPTION	INITIALS and DATE		
		DRG. TL.	CHECK	ENG. REG.
C	REVISED PER ECN 1387	4/24/75	✓	R
C	DOC. CHANGE PER ECN 1423 ADDED DAT TO DRAWING	5/12/75	✓	R
D	REVISED PER ECN 1434/1437	5/14/75	✓	R
E	REVISED PER ECN 1465	6/9/75	✓	R

- NOTES:
1. THIS ASSEMBLY DRAWING TO BE USED WITH 003185 REVISION B P.C. BOARD.
 2. ALL DIODES ARE 1N914.

- MODIFICATIONS: (TO BE DONE TO 003185 REV "B" P.C. BOARD)
1. ON CIRCUIT SIDE, CUT TRACE BETWEEN PINS 8 AND 9 OF C5, AND CUT L-SHAPED TRACE GOING TO PIN 8 OF C5, AS SHOWN:

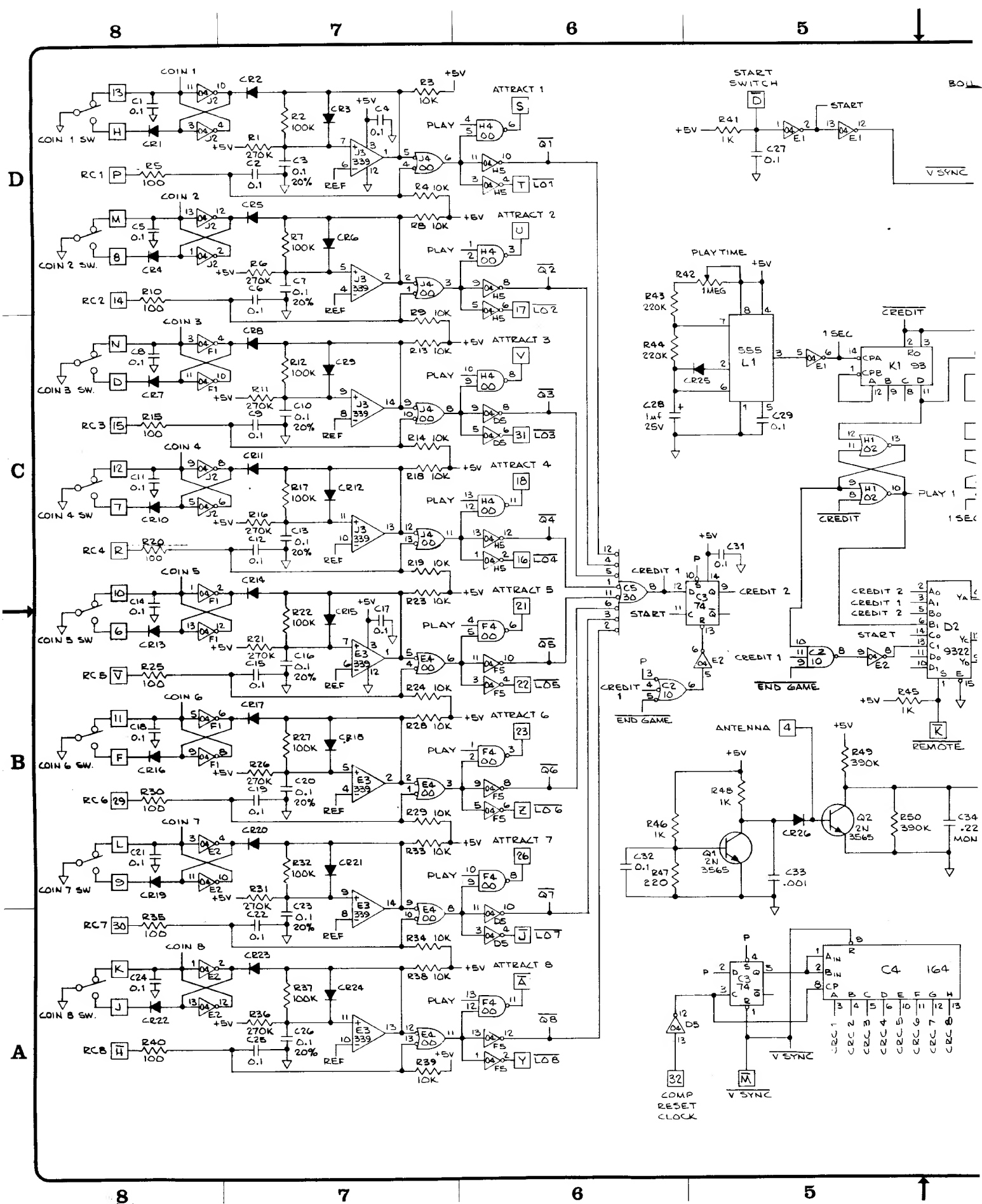


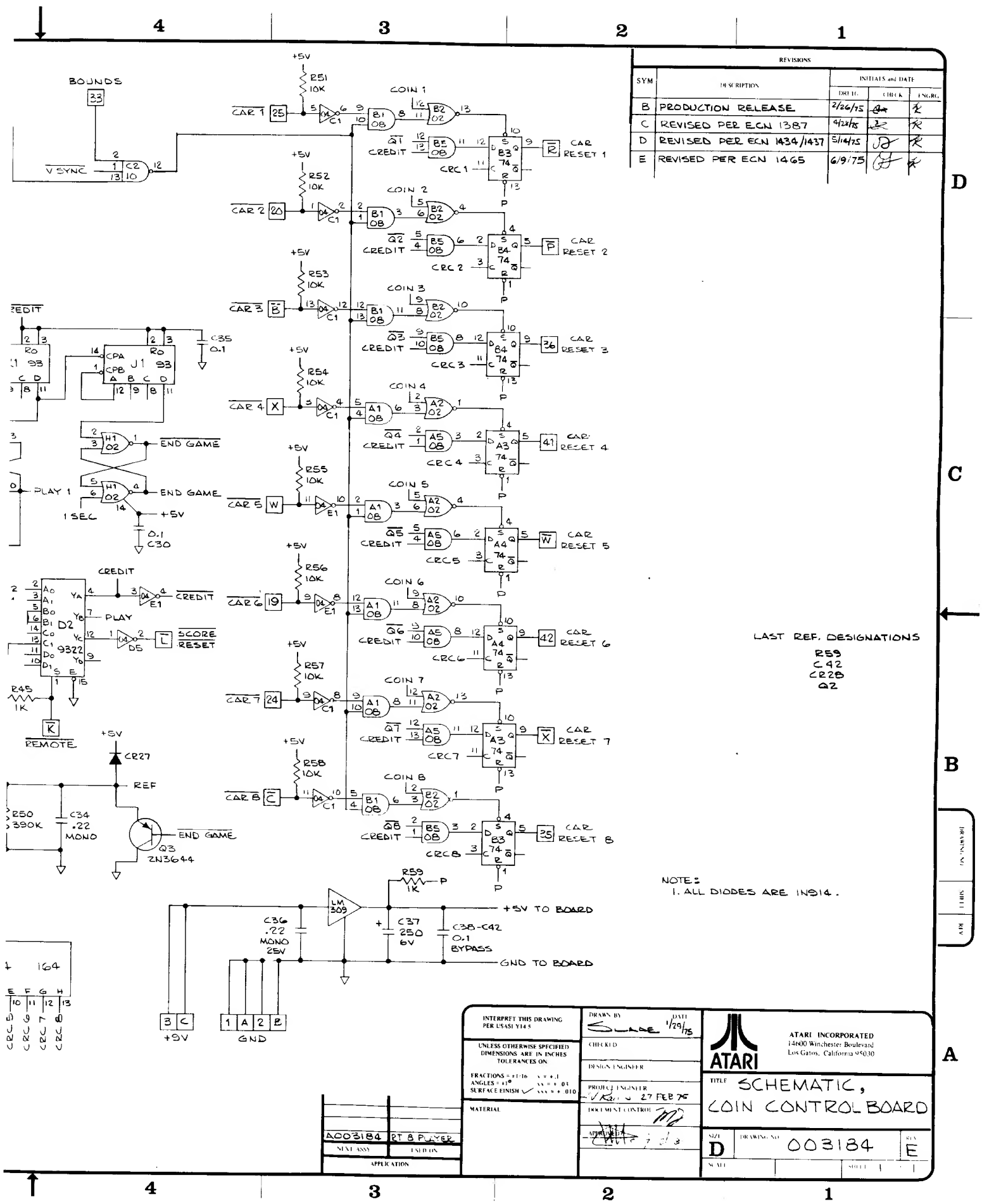
INDY 800	USED ON
APPLICATION	

INTERPRET THIS DRAWING PER USASI Y14.5 UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON: FRACTIONS = $\pm 1/16$ X .5 = .2 ANGLES = $\pm 1^\circ$.5X = .03 SURFACE FINISH \checkmark .001 MAX P. 010 MATERIAL: SEE P/L 003184	DRAWN BY SLADE DATE 4/24/75	ATARI INCORPORATED 14600 Winchester Boulevard Los Gatos, California 95030	TITLE ASSEMBLY, COIN CONTROL BOARD		
	CHECKED		PROJECT ENGINEER	SIZE	DRAWING NO.
	DESIGN ENGINEER		DOCUMENT CONTROL	D	A003184
				SCALE	2/1
				SHEET	1 OF 1

D
C
B
A

DRAWING NO.
SHEET
REV.





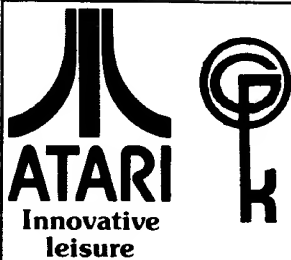
SYM	DESCRIPTION	INITIALS and DATE		
		DESIGN	CHECK	ENGR
B	PRODUCTION RELEASE			
C	REVISED PER ECN 1387			
D	REVISED PER ECN 1434/1437			
E	REVISED PER ECN 1465			

LAST REF. DESIGNATIONS

R59
C42
CR28
Q2

NOTE:
1. ALL DIODES ARE 1N514.

INTERPRET THIS DRAWING PER USASI Y14.5	DRAWN BY SUNDE DATE 1/29/75	ATARI INCORPORATED 14000 Winchester Boulevard Los Gatos, California 95030
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON: FRACTIONS = ±.10 ANGLES = ±1° SURFACE FINISH = .010	CHECKED DESIGN ENGINEER PROJECT ENGINEER DOCUMENT CONTROL	
MATERIAL	APPROVED DATE 1/29/75	SIZE D
APP. 003184 PT 8 PLATE	EXT. ASSY	DRAWING NO. 003184
APPLICATION	EXT. ASSY	REV E



ASSEMBLY TITLE / RT8 SYNC BOARD

P/L003182

PARTS LIST SPECIFICATION

Page 1 of 1

Drawn

Checked *MJ* 2-19-75

Mech. Eng.

Proj. Eng.

Elec. Eng.

REV.

E

Rev.	Description	Date	Apprv.	Rev.	Description	Date	Apprv.
A		2-4-75					
B	REV PER ECN 1143						
C	REV PER ECN 1160						
D	REV PER ECN 1183						
E	REV PER ECN 1390						

Item	Part Number	Qty.	DESCRIPTION
1	003183	1	Printed Circuit Board
2	37-LM309	2	LM309K Positive 5-Volt Regulator
3	78-06004	2	Heatsink, Wakefield 680-.75A
4	72-1610S	4	Screw, Mach, , Pn Hd, Phil, 6-32 x 5/8"
5	75-916S	4	Nut, Machine, Hex, 6-32
6			
7	75-056	4	Lock Washer, Internal Star, #6
8	66-071P4T	1	Rotary Switch, P.C. Mount, 1P-4T, Grayhill #71AF36-01-1-04-N
9	73-802	1	Switch Knob (Raytheon #50-5-1)
10	37-7400	6	7400 Integrated Circuit
11	37-7402	1	7402 " "
12	37-74H04	1	74H04 " "
13	37-7410	1	7410 " "
14	37-7417	2	7417 " "
15	37-7420	2	7420 " "
16	37-7427	2	7427 " "
17	37-7437	1	7437 " "
18	37-7474	1	7474 " "
19	37-7486	1	7486 " "
20	37-7490	1	7490 " "
21	37-7493	2	7493 " "
22	37-74107	2	74107 " "
23	37-74153	1	74153 " "
24	37-9316	3	9316 " "
25	003188	1	P-ROM, RT8 Check Points, 32 x 8, 256 Bit
26	003189	1	P-ROM, RT8 Racetrack, 256 x 4, 1024 Bit
27	90-101	1	14.318MHZ Crystal
28	10-5331	2	Resistor, Carbon, 5%, 1/4W, 330 ohm
29	10-5681	1	Resistor, Carbon, 5%, 1/4W, 680 ohm
30	10-5102	17	Resistor, Carbon, 5%, 1/4W, 1K ohm
31	10-5103	8	Resistor, Carbon, 5%, 1/4W, 10K ohm
32	28-101331	1	Capacitor, Mica, 330pf, 100V
33	27-101104	6	Capacitor, Ceramic, 0.1uf, 100V
34	29-011	2	Capacitor, Monolythic, .22uf, 12V
35	24-060257	2	Capacitor, Electrolytic, 250uf, 6V
36	37-7404	1	7404 INTEGRATED CIRCUIT
37	79-42116	2	SOCKET, I.C., 16 PIN

8

7

6

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J
H
F
E
D
C
B
AATARI © 75
PAT. NO. 3793483A003182
MADE IN USA

012 70A

C6
0.1D1 74107
C1 7420
B1 7486
A1 7400R1
1K
R2
1K
R3
1KC1
250 μ f
6V

SPARE

E2 7404

C7
0.1D2 7402
C2 7437
B2 7400
A2 74H04R4 680
R5 330
R6 330Y1
14.318 MHzLM
309

J3 7490

H3 7427

F3 74153

E3 74107

C8
0.1

D3 7410

C3 7474

B3 7400

A3 7420

C2
.22

J4 7400

H4 7427

F4 003189

E4 7493

C9
0.1

D4 7493

C4 9316

B4 9316

A4 9316

C5
330pfC4
250 μ f
6VJOK
R21

8

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6



5

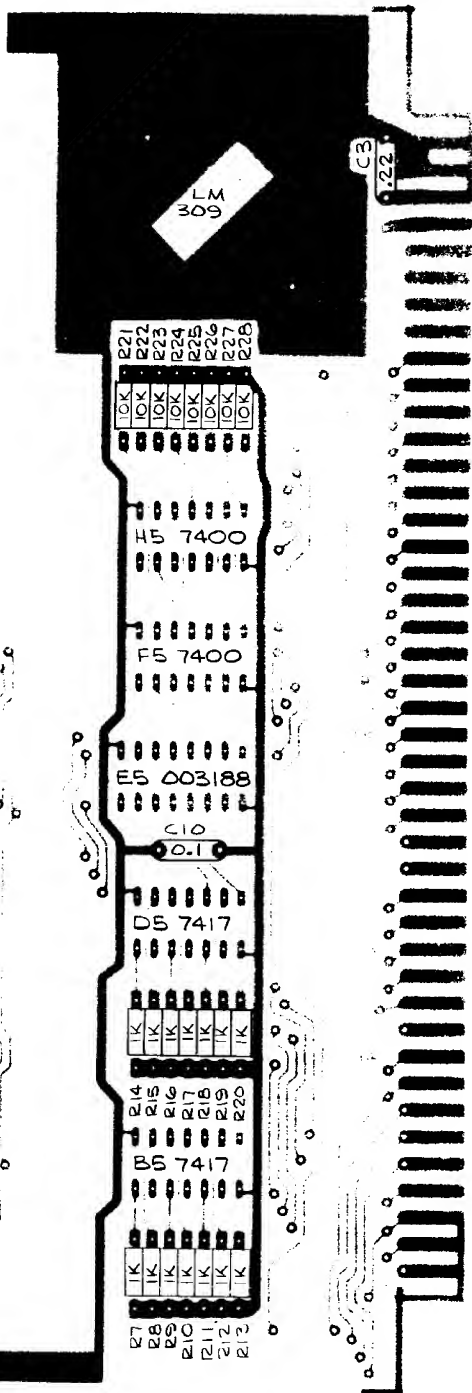
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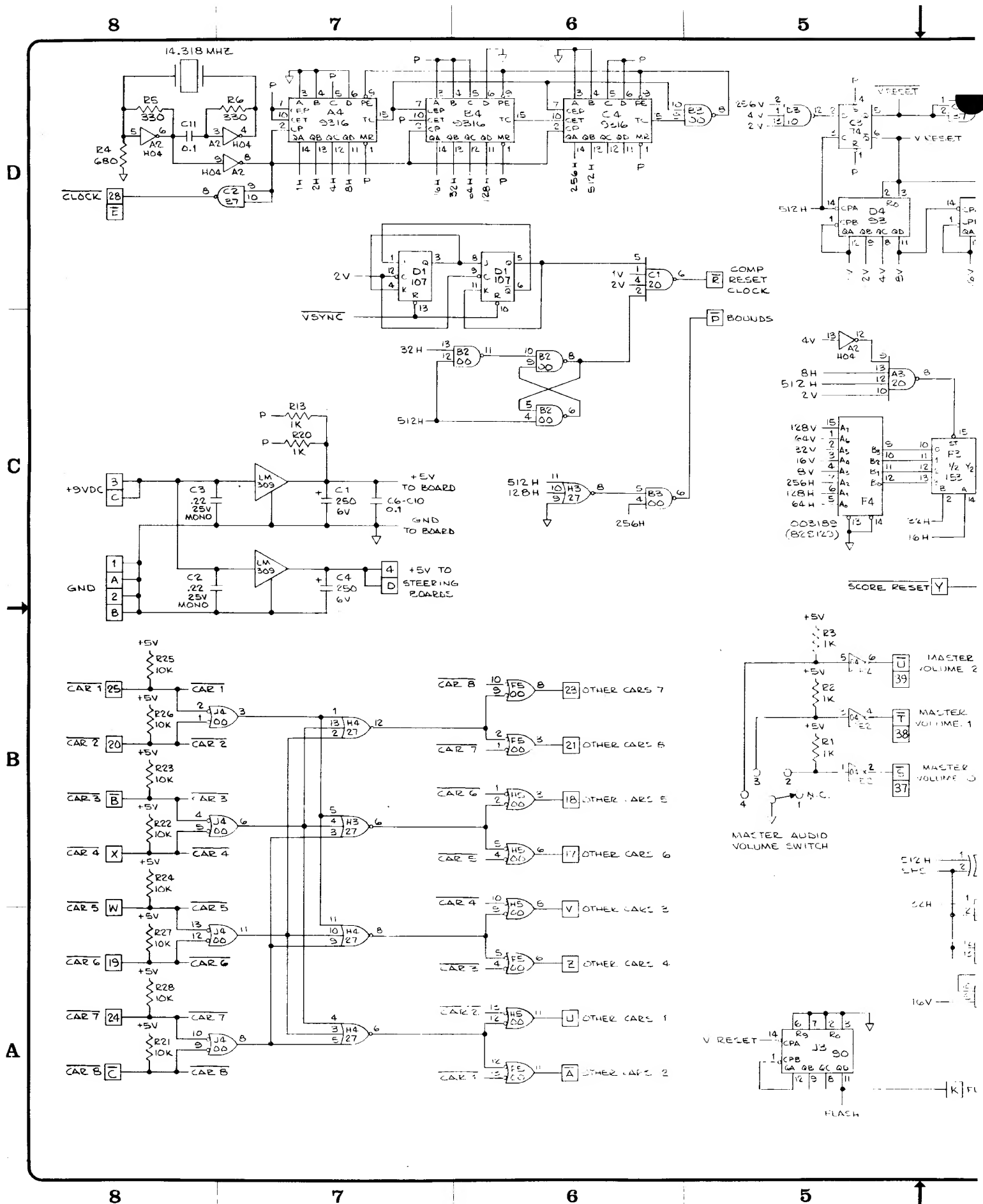
REVISIONS				
SYM	DESCRIPTION	INITIALS and DATE		
		PREP.	CHECK	ENGR.
E	REVISED PER ECN 1330	4/22/75		



NOTES:

1. INSTALL ITEM 37 (16 PIN I.C. SOCKET) IN POSITIONS F4 AND E5.
2. THIS ASSEMBLY DRAWING TO BE USED WITH 003183 REV B P.C.B.D.

INTERPRET THIS DRAWING PER USASI Y14.5		DRAWN BY <i>ELADE</i> 4/22/75		 ATARI INCORPORATED 14600 Winchester Boulevard Los Gatos, California 95030	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON:		CHECKED			
FRACTIONS - 1/16 1/8 1/4 1/2 3/4 1 1 1/2 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044 1045 1046 1047 1048 1049 1050 1051 1052 1053 1054 1055 1056 1057 1058 1059 1060 1061 1062 1063 1064 1065 1066 1067 1068 1069 1070 1071 1072 1073 1074 1075 1076 1077 1078 1079 1080 1081 1082 1083 1084 1085 1086 1087 1088 1089 1090 1091 1092 1093 1094 1095 1096 1097 1098 1099 1100 1101 1102 1103 1104 1105 1106 1107 1108 1109 1110 1111 1112 1113 1114 1115 1116 1117 1118 1119 1120 1121 1122 1123 1124 1125 1126 1127 1128 1129 1130 1131 1132 1133 1134 1135 1136 1137 1138 1139 1140 1141 1142 1143 1144 1145 1146 1147 1148 1149 1150 1151 1152 1153 1154 1155 1156 1157 1158 1159 1160 1161 1162 1163 1164 1165 1166 1167 1168 1169 1170 1171 1172 1173 1174 1175 1176 1177 1178 1179 1180 1181 1182 1183 1184 1185 1186 1187 1188 1189 1190 1191 1192 1193 1194 1195 1196 1197 1198 1199 1200 1201 1202 1203 1204 1205 1206 1207 1208 1209 1210 1211 1212 1213 1214 1215 1216 1217 1218 1219 1220 1221 1222 1223 1224 1225 1226 1227 1228 1229 1230 1231 1232 1233 1234 1235 1236 1237 1238 1239 1240 1241 1242 1243 1244 1245 1246 1247 1248 1249 1250 1251 1252 1253 1254 1255 1256 1257 1258 1259 1260 1261 1262 1263 1264 1265 1266 1267 1268 1269 1270 1271 1272 1273 1274 1275 1276 1277 1278 1279 1280 1281 1282 1283 1284 1285 1286 1287 1288 1289 1290 1291 1292 1293 1294 1295 1296 1297 1298 1299 1300 1301 1302 1303 1304 1305 1306 1307 1308 1309 1310 1311 1312 1313 1314 1315 1316 1317 1318 1319 1320 1321 1322 1323 1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338 1339 1340 1341 1342 1343 1344 1345 1346 1347 1348 1349 1350 1351 1352 1353 1354 1355 1356 1357 1358 1359 1360 1361 1362 1363 1364 1365 1366 1367 1368 1369 1370 1371 1372 1373 1374 1375 1376 1377 1378 1379 1380 1381 1382 1383 1384 1385 1386 1387 1388 1389 1390 1391 1392 1393 1394 1395 1396 1397 1398 1399 1400 1401 1402 1403 1404 1405 1406 1407 1408 1409 1410 1411 1412 1413 1414 1415 1416 1417 1418 1419 1420 1421 1422 1423 1424 1425 1426 1427 1428 1429 1430 1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441 1442 1443 1444 1445 1446 1447 1448 1449 1450 1451 1452 1453 1454 1455 1456 1457 1458 1459 1460 1461 1462 1463 1464 1465 1466 1467 1468 1469 1470 1471 1472 1473 1474 1475 1476 1477 1478 1479 1480 1481 1482 1483 1484 1485 1486 1487 1488 1489 1490 1491 1492 1493 1494 1495 1496 1497 1498 1499 1500 1501 1502 1503 1504 1505 1506 1507 1508 1509 1510 1511 1512 1513 1514 1515 1516 1517 1518 1519 1520 1521 1522 1523 1524 1525 1526 1527 1528 1529 1530 1531 1532 1533 1534 1535 1536 1537 1538 1539 1540 1541 1542 1543 1544 1545 1546 1547 1548 1549 1550 1551 1552 1553 1554 1555 1556 1557 1558 1559 1560 1561 1562 1563 1564 1565 1566 1567 1568 1569 1570 1571 1572 1573 1574 1575 1576 1577 1578 1579 1580 1581 1582 1583 1584 1585 1586 1587 1588 1589 1590 1591 1592 1593 1594 1595 1596 1597 1598 1599 1600 1601 1602 1603 1604 1605 1606 1607 1608 1609 1610 1611 1612 1613 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2214 2215 2216 2217 2218 2219 2220 2221 2222 2223 2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234 2235 2236 2237 2238 2239 2240 2241 2242 2243 2244 2245 2246 2247 2248 2249 2250 2251 2252 2253 2254 2255 2256 2257 2258 2259 2260 2261 2262 2263 2264 2265 2266 2267 2268 2269 2270 2271 2272 2273 2274 2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289 2290 2291 2292 2293 2294 2295 2296 2297 2298 2299 2300 2301 2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321 2322 2323 2324 2325 2326 2327 2328 2329 2330 2331 2332 2333 2334 2335 2336 2337 2338 2339 2340 2341 2342 2343 2344 2345 2346 2347 2348 2349 2350 2351 2352 2353 2354 2355 2356 2357 2358 2359 2360 2361 2362 2363 2364 2365 2366 2367 2368 2369 2370 2371 2372 2373 2374 2375 2376 2377 2378 2379 2380 2381 2382 2383 2384 2385 2386 2387 2388 2389 2390 2391 2392 2393 2394 2395 2396 2397 2398 2399 2400 2401 2402 2403 2404 2405 2406 2407 2408 2409 2410 2411 2412 2413 2414 2415 2416 2417 2418 2419 2420 2421 2422 2423 2424 2425 2426 2427 2428 2429 2430 2431 2432 2433 2434 2435 2436 2437 2438 2439 2440 2441 2442 2443 2444 2445 2446 2447 2448 2449 2450 2451 2452 2453 2454 2455 2456 2457 2458 2459 2460 2461 2462 2463 2464 2465 2466 2467 2468 2469 2470 2471 2472 2473 2474 2475 2476 2477 2478 2479 2480 2481 2482 2483 2484 2485 2486 2487 2488 2489 2490 2491 2492 2493 2494 2495 2496 2497 2498 2499 2500 2501 2502 2503 2504 250					





PARTS LIST SPECIFICATION

Page 1 of 1

Drawn	
Checked	Mech. Eng.
Proj. Eng. <i>L. G. 3 FEB 75</i>	Elec. Eng. <i>L. G. 3 FEB 75</i>
	REV.

Rev.	Description	Date	Apprv.	Rev.	Description	Date	Apprv.
A		2-3-75	<i>[Signature]</i>				
B	Rev per ECN 1142	2-18-75					
C	REV PER ECN 1167	2-27-75	<i>[Signature]</i>				
D	REV PER ECN 1288	4-28-75	<i>[Signature]</i>				
E							

Item	Part Number	Qty.	DESCRIPTION
1	003171	1	Printed Circuit Board
2	37-LM309	1	LM309K Positive 5-Volt Regulator
3	78-06005	1	Heatsink, Wakefield 680-1.0A
4	72-1412S	2	Screw, Mach., Sheetmetal, Pan Hd, Phil, 6-32 x 5/8"
5	75-916S	2	Nut, Machine, Hex, 6-32
6			
7	75-056	2	Lock Washer, Internal Star, #6
8			
9			
10	37-7400	1	7400 Integrated Circuit
11	37-7402	3	7402 " "
12	37-7404	2	7404 " "
13	37-7408	2	7408 " "
14	37-7410	1	7410 " "
15	37-7432	1	7432 " "
16	37-7448	1	7448 " "
17	37-7485	3	7485 " "
18	37-7490	8	7490 " "
19	37-7493	4	7493 " "
20	37-74153	4	74153 " "
21	37-74174	1	74174 " "
22	37-74175	1	74175 " "
23	37-9301	1	9301 " "
24	37-9312	17	9312 " "
25	37-9322	1	9322 " "
26	10-5102	2	Resistor, Carbon, 5%, 1/4W, 1K ohm
27	10-5103	10	Resistor, Carbon, 5%, 1/4W, 10K ohm
29	28-101331	1	Capacitor, Mica, 330pf, 100V
30	27-101104	6	Capacitor, Ceramic, 0.1μf, 100V
31	29-011	1	Capacitor, Monolythic, .22μf, 12V
32	24-060257	1	Capacitor, Electrolytic, 250μf, 6V

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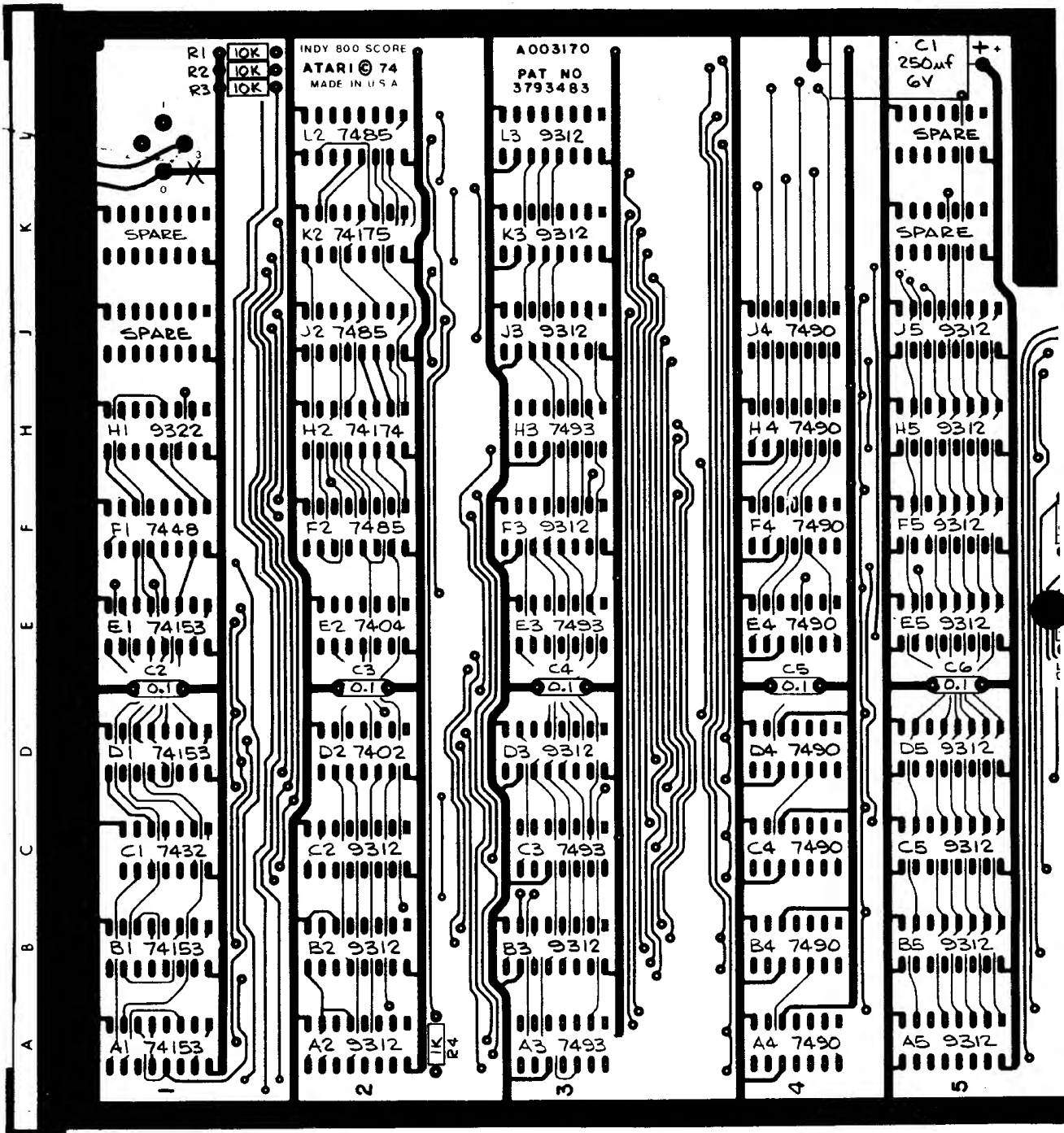
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D

C

B

A



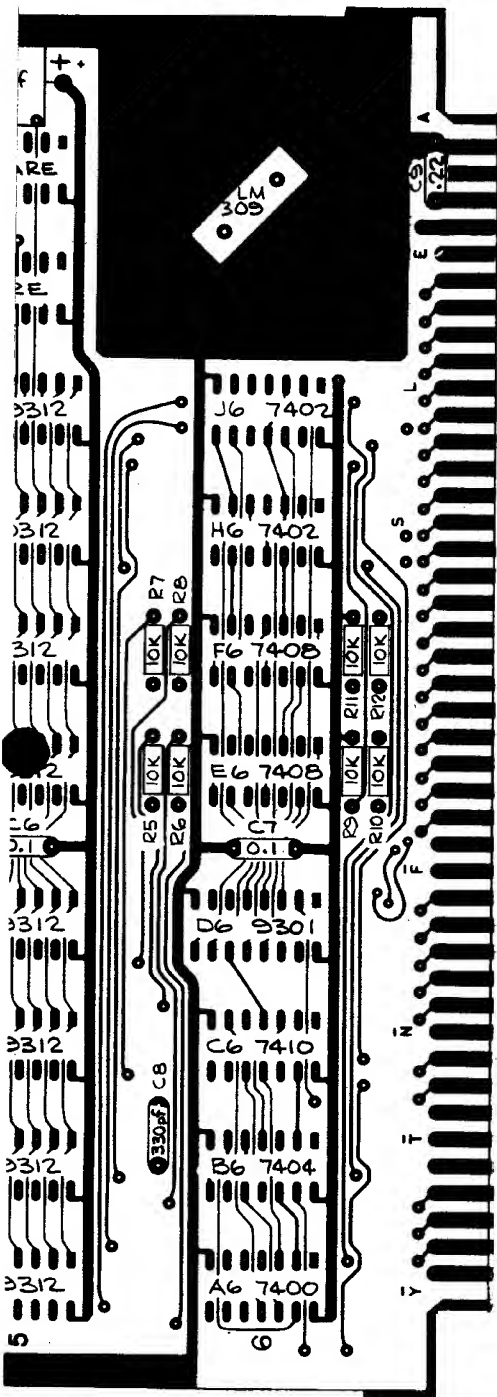
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REVISIONS				
SYM	DESCRIPTION	INITIALS and DATE		
		DFTG	CHECK	ENGRG
D	REVISED PER ECN 1388	4/28/75		R
E	REVISED PER ECN 1431	7/10/75		X 8



NOTE:

1. THIS ASSEMBLY DRAWING TO BE USED WITH 003171 REVISION B P.C.B.D.

MODIFICATIONS:

1. CUT TRACE THAT GOES TO "O" PAD IN UPPER LEFT CORNER OF BOARD.
2. JUMPER "O" PAD TO LARGE GROUND TRACE.
3. JUMPER "3" PAD TO LARGE GROUND TRACE.

D

C

B

DRAWING NO.

SHEET

REV

A

INDY 800	USED ON
APPLICATION	

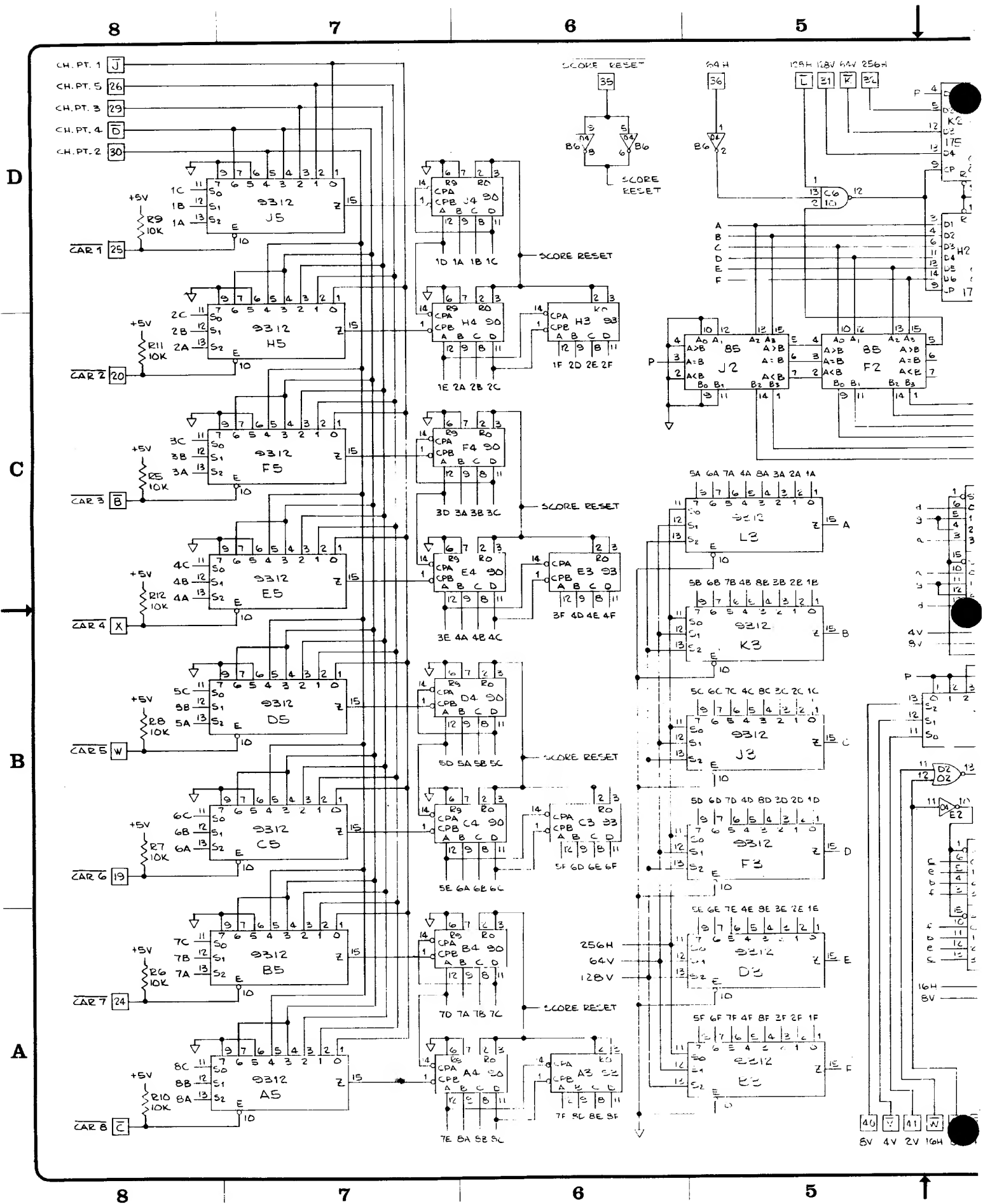
INTERPRET THIS DRAWING PER USASI Y14.5		DRAWN BY SLADE		DATE 4/23/75	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON:		CHECKED			
FRACTIONS = 1/16 x .001		DESIGN ENGINEER			
ANGLES = 45° x .001		PROJECT ENGINEER			
SURFACE FINISH ✓ x .001		DOCUMENT CONTROL			
MATERIAL SEE P/L 003170		APPROVED 7			
		ATARI		ATARI INCORPORATED 14600 Winchester Boulevard Los Gatos, California 95030	
		TITLE ASSEMBLY, SCORE BOARD			
		SIZE D		DRAWING NO. A003170	
		SCALE 2/1		REV E	

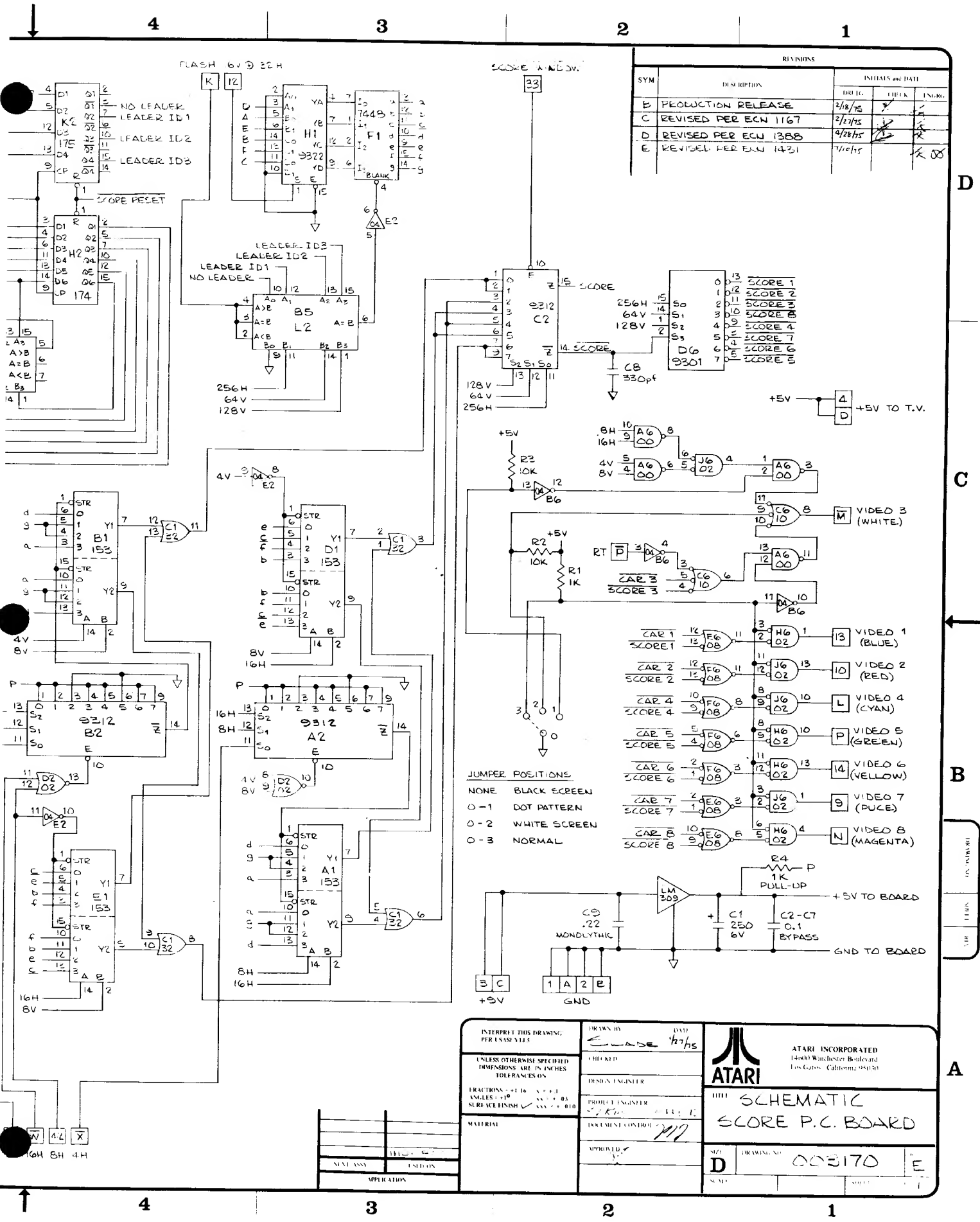
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


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REVISIONS				
SYM	DESCRIPTION	INITIALS and DATE		
		DRG. E.	CHECK	INSTR.
B	PRODUCTION RELEASE	2/18/75		
C	REVISED PER ECN 1167	2/17/75		
D	REVISED PER ECN 1388	4/28/75		
E	REVISED PER ECN 1431	7/16/75		

JUMPER POSITIONS

- NONE BLACK SCREEN
- 0-1 DOT PATTERN
- 0-2 WHITE SCREEN
- 0-3 NORMAL

- CAR 1 SCORE 1 VIDEO 1 (BLUE)
- CAR 2 SCORE 2 VIDEO 2 (RED)
- CAR 4 SCORE 4 VIDEO 4 (CYAN)
- CAR 5 SCORE 5 VIDEO 5 (GREEN)
- CAR 6 SCORE 6 VIDEO 6 (YELLOW)
- CAR 7 SCORE 7 VIDEO 7 (PURPLE)
- CAR 8 SCORE 8 VIDEO 8 (MAGENTA)

INTERPRET THIS DRAWING PER ANSI #11.5

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON:
FRACTIONS - +.125 - .001
ANGLES - +.01 - .001
SURFACE FINISH - MAX .001

MATERIAL

DRAWN BY
E. J. JONES 4/7/75

CHECKED

DESIGN ENGINEER

PROJECT ENGINEER
K. J. JONES

DOCUMENT CONTROL
M. J. JONES

APPROVED

ATARI INCORPORATED
14000 Winchester Boulevard
Los Gatos, California 95030

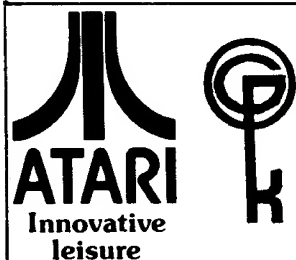
DATE
7/16/75

TITLE
SCHEMATIC
SCORE P.C. BOARD

SZ
D

DRAWING NO.
D003170

REV.
E



ASSEMBLY TITLE / RT8 CAR BOARD

P/L 003000

PARTS LIST SPECIFICATION

Page 1 of 2

Drawn	
Checked	Mech. Eng.
Proj. Eng.	Elec. Eng.
	REV. E

Rev.	Description	Date	Apprv.	Rev.	Description	Date	Apprv.
A		2-3-75					

Item	Part Number	Qty.	DESCRIPTION
1	002999	1	Printed Circuit Board
2	78-06004	1	Heatsink, Wakefield #680-.75A
3	37-LM309	1	LM309K Positive 5-Volt Regulator
4	37-LM340T-15	1	LM340T-15 Positive 15-Volt Regulator
5	37-7400	4	7400 Integrated Circuit
6	37-7402	2	7402 " "
7	37-7404	3	7404 " "
8	37-7406	1	7406 " "
9	37-7410	1	7410 " "
10	37-7414	1	7414 " "
11	37-7420	1	7420 " "
12	37-7474	2	7474 " "
13	37-7475	1	7475 " "
14	37-7485	1	7485 " "
15	37-7490	1	7490 " "
16	37-7492	1	7492 " "
17	37-7493	1	7493 " "
18	37-74107	2	74107 " "
19	37-74153	1	74153 " "
20	37-74193	3	74193 " "
21	003186	1	ROM, RT8 Car Video, 512 x 8, 4096 Bit
22	003187	1	P-ROM, RT8 Motion Code, 32 x 8, 256 Bit
23	37-9312	1	9312 Integrated Circuit
24	37-9316	5	9316 " "
25	37-555	2	555 Timer Integrated Circuit
26	37-LM324	1	LM324 Quad Op Amp
27	37-LM380	1	LM380 Audio Power Amp
28	34-2N3565	1	Transistor, NPN, Type 2N3565
29	003629	1	Transistor, Noise Source, 2N3643
30	35-2N3644	1	Transistor, PNP, Type 2N3644
31	31-1N914	8	Diode, Type 1N914
32	38-MV5013	2	Light Emitting Diode, Visible, Red
33	79-42424	1	24 pin Solder Socket
34	79-42116	1	16 pin Solder Socket
35	19-311103	1	10K ohm Trimpot
36	10-5151	2	Resistor, Carbon, 5%, 1/4W, 150 ohm
37	10-5102	7	" " " 1K ohm
38	10-5152	1	" " " 1.5K ohm
39	10-5332	1	" " " 3.3K ohm
40	10-5472	8	" " " 4.7K ohm

PARTS LIST SPECIFICATION

REV E

Page 2 of 2

Item	Part Number	Qty.	DESCRIPTION
41	10-5103	9	Resistor, Carbon, 5%, 1/4W, 10K ohm
42	10-5123	1	" " " " 12K ohm
43	10-5153	1	" " " " 15K ohm
44	10-5333	1	" " " " 33K ohm
45	10-5683	1	" " " " 68K ohm
46	10-5823	1	" " " " 82K ohm
47	10-5104	7	" " " " 100K ohm
48	10-5224	2	" " " " 220K ohm
49	10-5474	2	" " " " 470K ohm
50	10-5105	2	" " " " 1M ohm
51	10-5225	1	" " " " 2.2M ohm
52	10-5475	1	" " " " 4.7M ohm
53	19-311254	1	250K ohm Trimpot
54	28-101101	4	Capacitor, Mica, 100pf, 100V
55	27-101103	4	" Ceramic, .01uf, 100V
56	21-250103	1	" Film (Mylar), .01uf, 25V
57	27-101104	12	" Ceramic, 0.1uf, 100V
58	21-250104	1	" Film (Mylar), 0.1uf, 25V
59	29-011	2	" Monolythic, 0.22uf, 12V
60	24-250105	1	" Electrolytic, 1uf, 25V
61	24-250505	2	" Electrolytic, 5uf, 25V
62	24-250106	4	" Electrolytic, 10uf, 25V
63	24-250507	1	" Electrolytic, 500uf, 25V
64	72-1412S	2	Screw, Mach, Sht Mtl, Pn Hd, Phil, 6-32 x 5/8"
65	75-916S	2	Nut, Machine, Hex, 6-32
66			
67	75-056	2	Lock Washer, Internal Star, #6
68	31-IN4001	2	DIODE, IN4001

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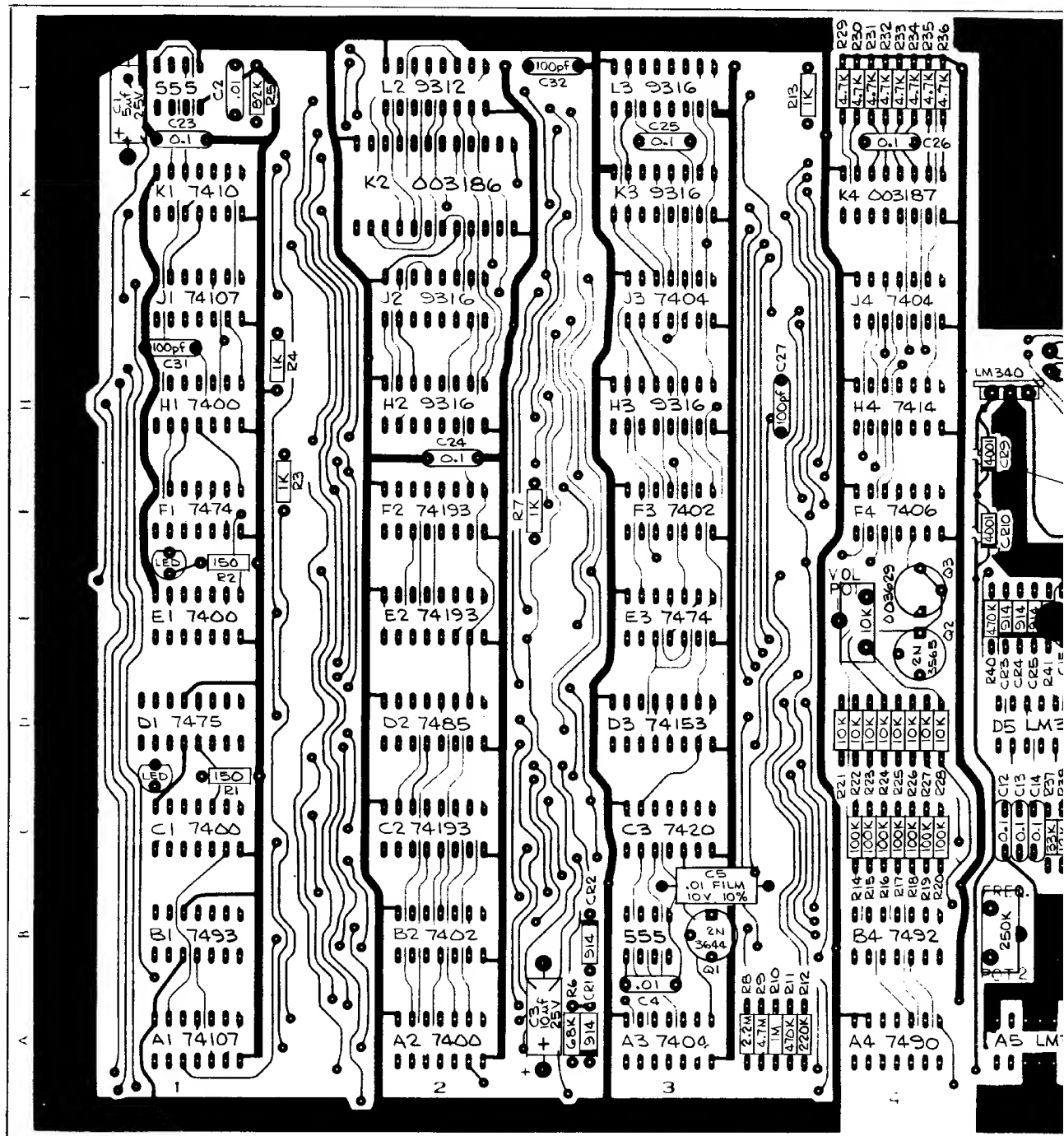
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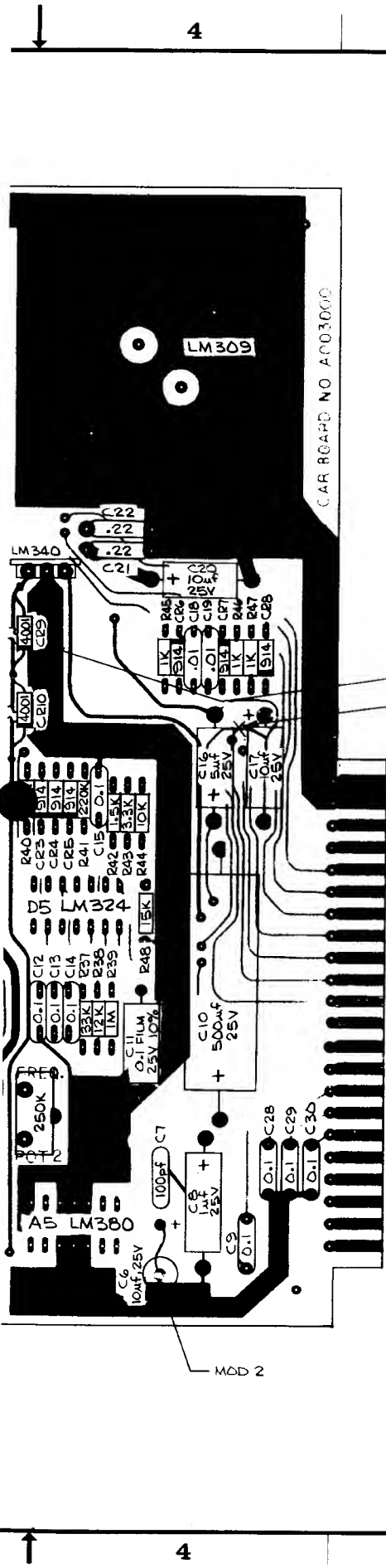
D

C

B

A





REVISIONS				
SYM	DESCRIPTION	INITIALS and DATE		
		DRFT	CHEK	ENGR
D	REVISED PER ECN 1391	4/24/75	SD	R
E	REVISED PER ECN 1428	5/12/75	SD	R

NOTES:


1. LED'S TO BE MOUNTED POINTING TOWARDS BACK OF BOARD AND LAYING DOWN.
2. THIS ASSEMBLY TO BE USED WITH 002999 REVISION "B" P.C. BOARD.

MODIFICATIONS : (TO REVISION "B" AND REVISION "C" 002999 BOARDS).

1. INSTALL TWO 1N4001 DIODES IN SERIES AS SHOWN, CUTTING TRACE UNDERNEATH EACH DIODE.
2. INSTALL 10uf 25V CAPACITOR AS SHOWN, STANDING UP.

MODIFICATION : (TO REVISION "B" 002999 BOARDS ONLY)

3. CUT TRACE AS INDICATED. JUMPER + (POSITIVE) END OF C17 (10uf /25V) CAPACITOR TO D5 PIN 2 (LM324).

INTERPRET THIS DRAWING PER USASI Y14.5	DRAWN BY <i>SLADE</i> DATE 4/25/75	 ATARI INCORPORATED 14600 Winchester Boulevard Los Gatos, California 95030	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON:	CHECKED		TITLE ASSEMBLY, CAR BOARD
FRACTIONS = 1/16 N = .1 ANGLES = 10° XX = .03 SURFACE FINISH XXX = .010	DESIGN ENGINEER		SIZE D
MATERIAL SEE P/L003000	PROJECT ENGINEER 4/1/75 27 Ark 75		DRAWING NO A003000
	DOCUMENT CONTROL		REV E
	APPROVED <i>SLADE</i> /	SCALE 2/1	SHEET OF

INDY 800
NEXT ASSY
USED ON
APPLICATION

